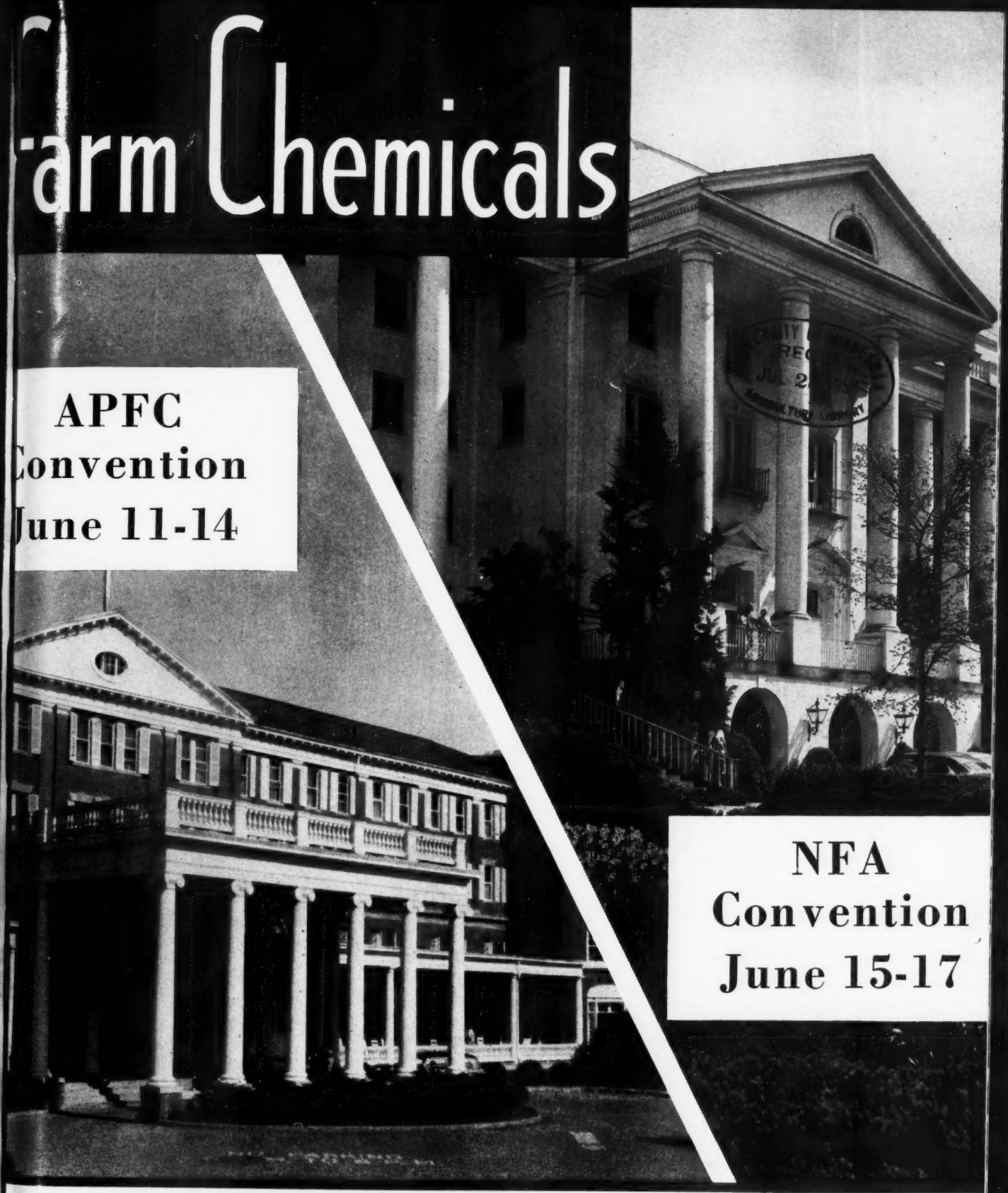
arm Chemicals



APFC Convention June 11-14

NFA Convention June 15-17

NITROGEN DIVISION ALLIED CHEMICAL

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Aside from package design, it's hard to tell one manufacturer's bag from another's simply by looking at it or fingering it.

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Men who buy 85 per cent of all Multiwalls consider* these intangibles more important than any other factor when they choose their supplier.

Invariably, these are among the first questions they ask . . .

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In a nutshell—

"Are they good people to do business with?"

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In these days of industrial pressure, when *dependability* is a fervent wish as well as a word, men to whom Multiwalls are important are placing an increasing share of their orders with Union.

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TRADE MARK UNION

*August, 1951 research study.

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Published monthly. Annual subscription: in the United States, $3.00; Canada and Mexico, $4.00; other countries, $5.00. Entered as second-class matter, January 15, 1910, at the Post Office at Philadelphia, Pa., under Act of March 3, 1879. Registered in United States Patent Office. Publication office, 317 N. Broad St., Phila. 7, Pa.

In this issue . . .

It's convention time again in the fertilizer industry. Talk among leaders in the field has turned in recent weeks to the program for the American Plant Food Council and the National Fertilizer Association meetings. Plans were being made to attend the annual sessions and advance registration figures from both organizations indicate capacity registration and record attendance. First on the schedule is the APFC, which will meet at the Homestead, Hot Springs, Va., June 11–14. Following immediately will be NFA's annual get-together, set for the Greenbrier, June 15–17. The usual fine line-up of speakers, panels and entertainment is included in the plans, with banquets highlighting both conventions. For complete details on the APFC meeting, turn to page 12. The article starting on page 18 gives the schedule for the NFA convention.

Everybody knows that vast changes have taken place during the past 10 years in the kinds and quantities of farm chemicals used by U. S. farmers. But a good summary of the situation, giving the outlook for the future always is welcomed by members of the industry. That's why we're printing as much as possible of just such a report on page 21 in this issue. It is the Pesticide Situation for 1952–53 and was prepared by the pesticides staff of the Office of Materials and Facilities, Production and Marketing Administration.

A question and answer session was one of the most popular parts of the program at a recent fertilizer safety conference. The one-day session was held in Baltimore as part of the Governor's Safety-Health Conference. More than 50 industry representatives, responsible for plant safety in fertilizer companies in the Maryland area, attended the meeting. Some of the questions, with answers suggested by a special panel, are given in the writeup on page 37.

Normally small scale spraying of farmland by airplane is an unprofitable venture. A situation developed among tobacco farmers in northwest Missouri in 1951, however, that made such a spraying profitable to the farmers involved as well as to the chemical company supplying the pesticide materials. Read the interesting story of the spray operation to control tobacco horn worms on page 41. Insecticide used for the job—TDE—has proved highly successful, according to farmers in the area.

Fertilizer consumption is still going up. That's the most important news given in the recent USDA report prepared by Walter Scholl and Hilda Wallace. A seven per cent increase was recorded in the U. S. and its territories in the year ended June 30, 1952, over the previous year. Total consumption of plant foods was 22,432,418 tons, according to the report. The complete report, together with tabulations showing quantities, kinds and grades of plant nutrients, is presented on page 45.

farm chemicals

Formerly
American Fertilizer & Allied Chemicals
Established 1894
PIONEER JOURNAL OF THE FARM CHEMICALS INDUSTRY

Vol. 116 JUNE, 1953 No. 6

Contents

Cover Story

The cover photo this month tells its own story. The Homestead Hotel, Hot Springs, Va., pictured at left, will be the setting for the American Plant Food Council convention June 11–14 while the Greenbrier Hotel, White Sulphur Springs, W. Va., will be the headquarters for the annual meeting of the National Fertilizer Association, June 15–17.

A magazine international in scope and circulation and devoted to manufacturers, mixers, and formulators of fertilizers and pesticides

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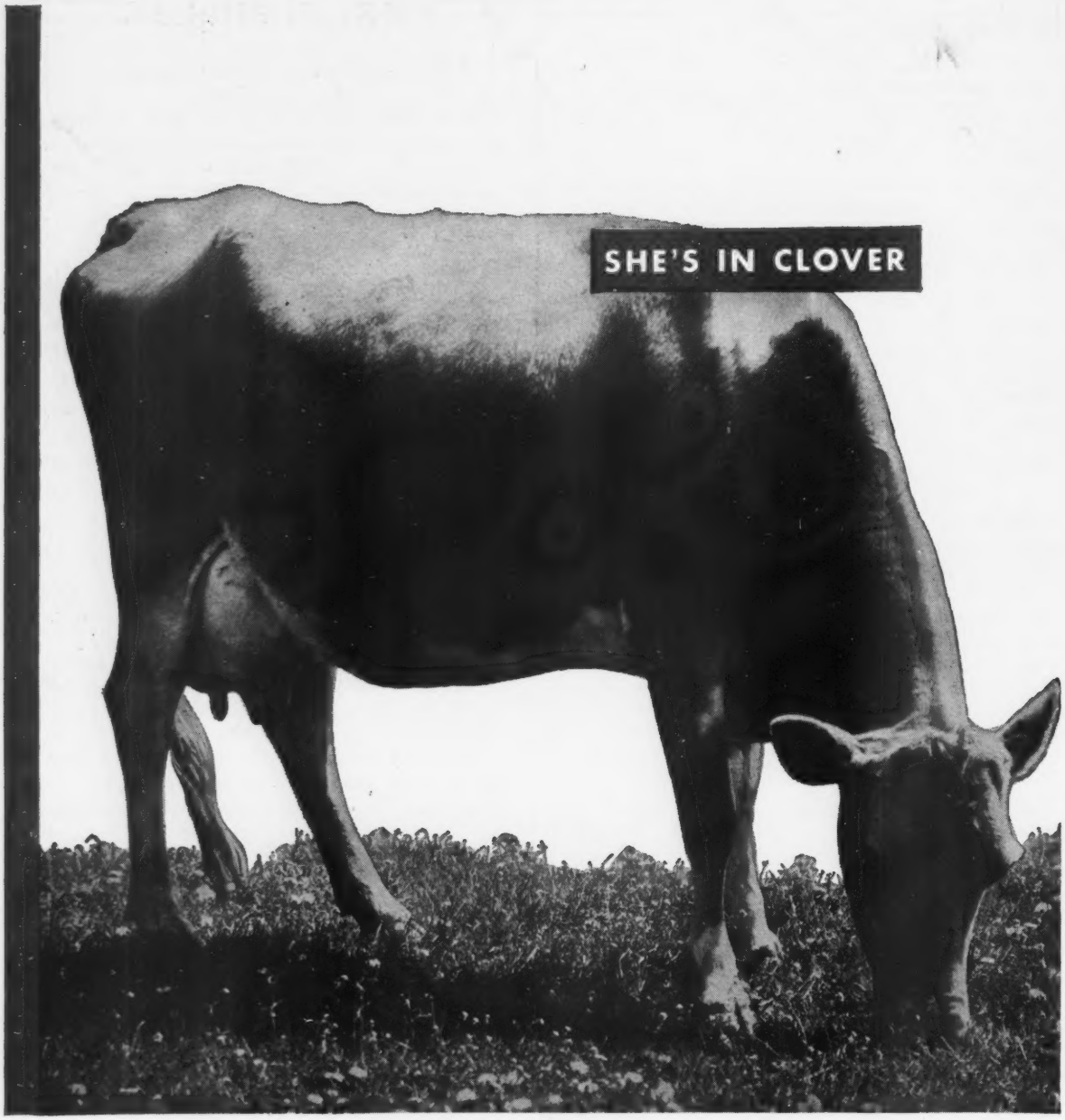

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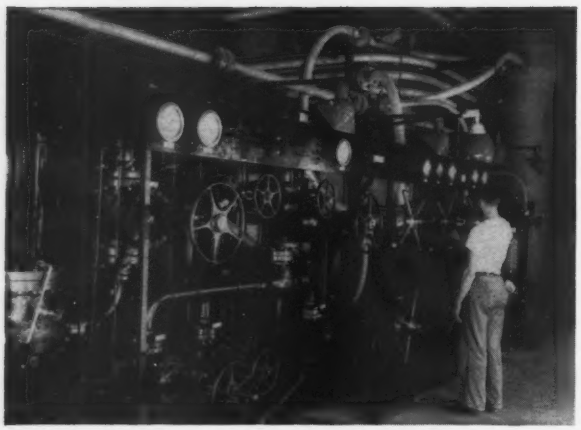

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America's Growing Name in Chemicals

farm chemicals facts

. . . Briefly Noted

Paul A. Fodor Jr., is new chief of the inorganic and agricultural chemical branch of the National Production Authority. A district sales manager at Philadelphia for Columbia-Southern Chemical Corp., Fodor is on leave of absence during his temporary service with the government. He has been associated with the company for 13 years and is a graduate of Ohio State University with a Bachelor of Chemical Engineering degree.

Fodor

Nationwide attention was focused on Ferro Corp.'s FTE last month with publication in **Life** magazine of an article on the fritted trace element material. It was described as one of the major agronomic developments of recent years.

Robert C. Berry is new representative of Newton Chemical & Supply Co. Berry will work from the agricultural chemicals department as field entomologist. He is a graduate of the University of Delaware and formerly served as field entomologist with S. B. Penick & Co.

New appointments at Pittsburgh Plate Glass Co. include Michael J. Batenburg, general advertising manager and Richard W. Dittmer, assistant director of public relations.

A regular quarterly dividend of 50 cents a share on the common stock of Lion Oil Co. has been issued by the company, payable June 16.

Died: Charles B. Dunne, vice president of French Potash & Import Co., suddenly at his home May 10. He started his business career with W. R. Grace & Co. and joined French Potash in 1922.

Spencer Chemical Co. is co-sponsor with the National Association of Soil Conservation Districts of a 1953 speaking contest on the topic, "Democracy at Work in My Soil Conservation District.' Offered in cash prizes is $1700.

Opening of a western sales office in the Victor Building, 6 West Tenth Street, Kansas City, Mo., is announced by Union Bag & Paper Corp. Located at the office are B. J. O'Hearn, southwestern district manager for multiwall bag sales and W. H. Burget, sales representative.

The United States is enabling Pakistan to purchase fertilizer. Last month this country advanced $3,700,000 to Pakistan for plant foods and another $3,000,000 to assist in construction of a fertilizer plant at Karachi.

NFA reports that fertilizer sales so far are falling behind the record pace of last year. In view of lowered farm income, however, the association says things aren't so bleak. In fact NFA says it expects much and possibly all lost ground to be regained on a national basis by the end of the year.

Fulton Bag & Cotton Mills has appointed James D. Evans to the sales staff of its New Orleans division. He will have headquarters at Alexandria, La.

Just released for chemical industry: revised edition of Manufacturing Chemists Association publication on chemical labeling. **"Manual L-1: Warning Labels,"** available from MCA, 246 Woodward Building, Washington 5, D. C., $1.

Dr. John Horsfall, pioneer in industrial entomology, retired last month from his position as chief entomologist for American Cyanamid Co.

CALENDAR

June 11–14—APFC Convention, Hot Springs, Va.

June 15–17—NFA Convention, White Sulphur Springs, W. Va.

June 22–23—So. Feed & Fert. Control Officials Convention, Clemson, S. C.

June 30—La. Fert. Grade Conf., Baton Rouge, La.

June 30–July 2—Regional Fert. Conf., Pullman, Wash.

Ralph K. Gotshall was elected president of Atlas Powder Co. last month and was named also to head the executive committee. He succeeds **Isaac Fogg,** who became chairman of the board and remains chairman of the finance committee.

A newly developed fungicide called Orthicide is being offered by California Spray-Chemical Corp. It has a dual function: as a fruit spray and as a seed protectant.

Plenty of pesticides for 1953 is the word from USDA. Those large carryovers of materials from last season, so familiar to members of the industry, are listed as the cause of the plentiful supply. Adverse effects on future supplies may result, the department warned, from recently slackened production.

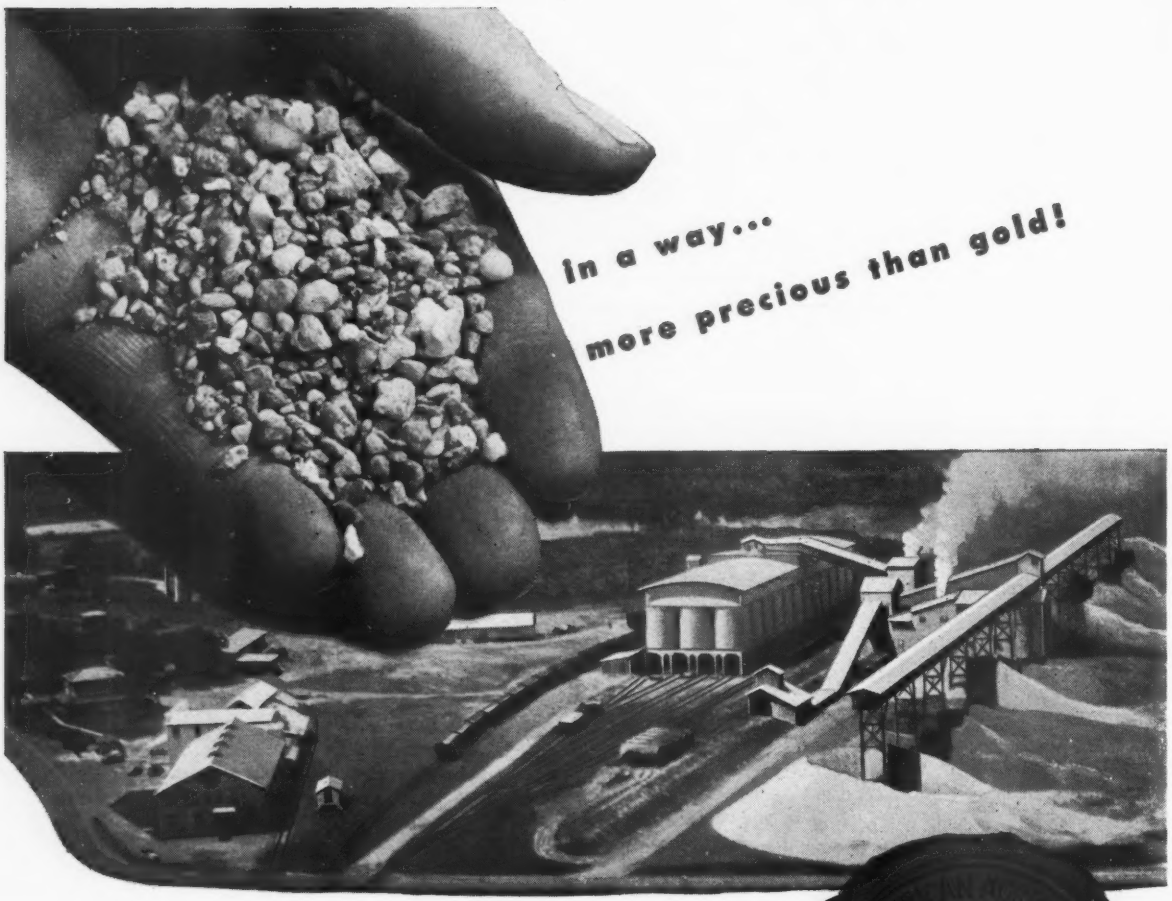
Rust spreading barberry bushes can be killed with the herbicide **MCP,** which eradicates the bush, a host of stem rust that causes widespread damage to wheat, oats, barley and rye, according to USDA.

Four personnel changes at Stadler Fertilizer Co., Cleveland, have been announced. Former President John F. Johnson was elected board chairman, Wesley V. Johnson was named president and treasurer, Otto C. Herbst was moved up to vice president and secretary and Vern E. Winans was appointed vice president in charge of sales.

Want to get more information on the relatively harmless periodical cicada? USDA has a booklet available on the insect, better known as the 17-year locust, telling of its life history, habits and methods of control. It's due this year, so you may want to get a copy of the booklet from the Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

Dow Chemical's Ovotran Wettable has been approved for use in California on apple and pear trees. The miticide is highly destructive to pests in the egg stage. (The material was described in detail in **Farm Chemicals,** August, 1952, page 23.)

Arthur L. Ross was named a vice president of International Paper Co. last month. Ross has served with International for 28 years.



Air view showing dryers and rock storage at Pierce, Florida, headquarters of A.A.C. phosphate mining operations. (Top) Sample of Florida Pebble Phosphate Rock, source of phosphorus widely used in the chemical industries, in its elemental form as well as in phosphoric acid, phosphates and phosphorus compounds. ¶ This pebble rock is also the principal source of the most important—and most generally deficient—plant food element. Often called the Key to Life, phosphorus is essential in maintaining and improving crop yields. Health, growth, life itself, would be impossible without phosphorus . . . so in a way these phosphate pebbles are more precious than gold.

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farm chemicals outlook

Report from Washington
by Fred Bailey & John Harms

Barometers of farm thinking show growing recession complex among farmers. Government indices, surveys and forecasts, coupled with private reports indicate that farmers are losing optimism for the future.

Increasing numbers of farmers are thinking of selling out . . . because of what seems to them a dim future. Farm auctions are becoming more numerous . . . farm credit continues to soar . . . farm land values definitely are off their peak and sliding down. This reflects farmer reaction to lower farm prices and the prospect for less net income this year.

Farm prices continue to point down this spring, at a time when they normally would strengthen. But production costs stick stubbornly to high levels . . . and most likely will pretty well stay put. While the economists are betting farm prices will "stabilize" yet this spring . . . they look for another sizeable dip when the new crops come in this fall.

Net farm income this year is expected to be as much as 10 per cent lower than last year's $14.3 billion. That means more than $1 billion below last year . . . although that figure is admittedly on the pessimistic side.

Other hard realities facing farmers are these: Surpluses of some crops over-hang markets . . . record-breaking cattle population . . . low irrigation water levels in many Western areas . . . over-winter effects of 1952 drought . . . 30 per cent drop in export markets.

And the topping on all of this is the fact that farmers themselves are doing little to bolster their prices. They apparently plan to grow as much food and fiber this year as they did last.

Actually, farmers now are experiencing the big re-adjustment from inflation of past 10 years . . . so say the economists. While this year will see continued "re-adjustment," the economists do not look for a big bust on the farms this year.

Farmers are producing themselves right into production controls on next year's crops, officials are saying here. Work already has begun on oiling machinery to invoke marketing quotas and acreage allotments on 1954 crops of cotton and wheat.

Effect on fertilizer sales of farm income down-trend is being studied now by USDA fertilizer specialists . . . details available in about a month.

But curb-stone consensus of the experts here indicates that few top-level fertilizer men look for much of a cut in plant food use this year . . . despite lower farm-produce prices. Thinking is that farmers, who face lower unit prices, will pour on the plant nutrients to increase volume of production to make up for what they lose in unit prices.

Some officials are predicting that farmers will have used about 8 per cent more plant food during the current fiscal year than they did last year. They also believe that the 10 per cent annual increase in nitrogen fertilizer use of

the past few years may not be halted . . . if anything, they say, increased nitrogen use may only be slowed somewhat.

General feeling here is that only in event of a drastic decline in farm prices and income will fertilizer sales show a significant loss.

Pesticide sales, on the other hand, are expected to feel the slump in farm prices more acutely . . . and earlier. Officials here say that pesticide sales "are almost directly tied to the level of farm prosperity." The unknown in the pesticide picture is the probable reaction of farmers to a big onslaught of infestation endangering their production volume during a period of declining farm prices.

Early insect surveys this year indicate 1953 may be a "normal" year of infestation generally.

But watch boll weevil in the Southeast. The weevil threatens broad destruction if weather conditions continue favorable . . . over-winter populations were extremely large in many areas. Cotton insecticide purchases may soar if threat materializes . . . such things as calcium arsenate, BHC, parathion, aldrin, toxaphene, dieldrin and chlordane. Weevil season begins about July 1, ends about Sept. 15.

Chances for enactment of pesticide control legislation during the present session of Congress now appear less than 50-50. Hearings on the Miller bill still were not set as we went to press. Chairman Wolverton (R.-N. J.), of the House Interstate Committee, says he hopes to get started "sometime in June."

Big obstacle to getting Miller proposals through is the log-jam of this session's "must" legislation. Congress lost a month on the tidelands debate . . . faces pressure for adjournment by end of July. While it's still possible, chances for passage of pesticide legislation gets slimmer as the session nears its end. Feeling on the Hill is increasing that this legislation can be put off until the second session of the 83rd Congress.

Mail support for the Miller bill is "unusually heavy." Wolverton estimates letters to his committee and to Miller now total about 500 . . . including support from state universities in Illinois, Virginia, Washington and Wisconsin, also health departments in various states.

1953 crop year pesticide requirements by farmers, as forecast by the Department of Agriculture, likely will fall in the following ranges:

BHC--80-95 million lbs.; Calcium arsenate--5-25 million lbs.; Copper sulfate--85-100 million lbs.; 2,4-D (acid basis)--28-32 million lbs.; DDT--70-85 million lbs.; Lead arsenate--18-30 million lbs.; Parathion--5.5-6.5 million lbs.; sulfur, ground--300-425 million lbs.; 2,4,5-T (acid basis)--3.4-5 million lbs.

Government scientists are recommending a new chemical to kill barberry bushes . . . carrier of the destructive stem rust of wheat, oats, barley and rye. Tests conducted by the Bureau of Entomology show MCP (2-methyl 4-chlorophenoxyacetic acid), a hormone-type herbicide, effectively eradicates the common or European barberry.

USDA researchers this summer will field test further on new carbamate and urea derivatives as pre-emergence weed killers . . . with industry supplying the materials.

Falling farm prices are giving government researchers added incentive to develop money-saving practices for fighting pests. One possibility is application of several protectants in one trip over the field . . . fumigants for nemotodes, fungicides for other organisms, chemicals for weed control and possibly systemic insecticides.

Comparative soil conditioner effectiveness has been tested by Doane Agricultural Institute of St. Louis. Doane tests show wide variance in per cent of water stable aggregates, ranging from 11.5 to 57.8 per cent. Summary of tests may be obtained by writing Doane Agricultural Service, 5144 Delmar Blvd., St. Louis, Mo.

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Golfing at the Homestead Hotel, Hot Springs, Va., scene of Convention.

June 11-14 . . .

Top Speakers Highlight Eighth APFC Convention

As USUAL the American Plant Food Council has an all-star lineup ready for its members and their families when the annual association convention gets under way June 11.

A top notch list of speakers, including two members of the House of Representatives, a member of President Eisenhower's cabinet and other leading figures in the field of chemicals for the farm, will be on hand at the picturesque old Homestead at Hot Springs, Va., for the convention, which will run to June 14.

And, again as usual, a large number of fertilizer manufacturers, agricultural education and research leaders are expected to attend the session.

Paul T. Truitt, Council president, said advance registrations for the convention indicate that attendance may be well over 500.

Always a big drawing card for the conventions, of course, is the excellent accommodations offered by the Homestead, situated high in the Blue Ridge Mountains and offering fine facilities for recreation and relaxation.

Prominent on the tentative program for the convention is a full complement of entertainment scheduled for conventioneers in their spare moments between business sessions.

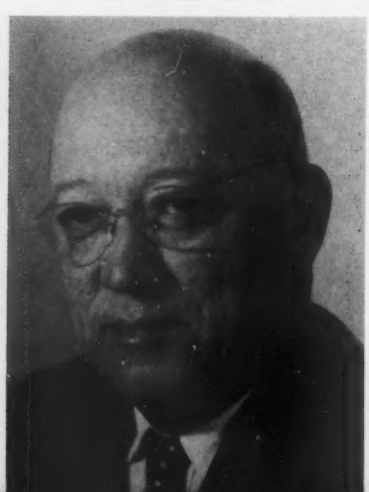
Highlight of the eighth annual meeting will be a banquet address by Rep. Walter H. Judd (R.-Minn.)

The banquet is scheduled for Saturday evening at 7:45, with the featured speaker following at 9. Rep. Judd, regarded as an international authority on the

H. A. Woodle

Arnold W. Klemme

William E. Martin



Lester H. Smith

Near East, is a native of Rising City, Neb.

He received his B.A. and M.D. degrees from the University of Nebraska and served in World War I.

Other important talks on the program include an outline of the recent changes in the U. S. Department of Agriculture, brought about by the Eisenhower administration, a discussion of Congress and its policies for the farm and a four-man forum representing all parts of the country and discussing the pertinent question of plant food potentials across the nation.

The first of these addresses, "Changing Policies in the USDA," will be delivered by J. Earl Coke, assistant secretary of agriculture.

Policy Changes

His talk will cover many of the program changes and policies in the Department of Agriculture, particularly in the field of research, extension and land use in which he has the administrative responsibility under the reorganization of the department.

As assistant secretary, Coke has the following divisions of the USDA under his jurisdiction: Agricultural Conservation program, Agricultural Research Administration, Bureau of Agricultural Economics, Extension Service, Forest Service and Soil Conservation Service.

"Congress and Farm Policy" is the title of a talk to be given by Rep. Clifford R. Hope (R-Kan.) chairman of the House Committee on Agriculture. He will be the first speaker on the program for Saturday morning.

Rep. Hope is expected to outline the present legislative philosophy of Congress toward the farm, in regard to price support legislation, grain storage and other issues facing agriculture.

The special panel discussion will be moderated by Dr. Paul D. Sanders, editor of *The Southern Planter*.

Also scheduled for the final session of the convention, the panel will include well-known extension agronomists representing the New England, southern, midwest and western sections of the United States.

On the panel, in order of their geographical representation, will be Lester H. Smith, extension

American Plant Food Council

PROGRAM

THURSDAY

	Registration.
4 p.m.	**Ladies' Tea.**
9 p.m.	**Meeting of Board of Directors.**
9 p.m.	**Game Night.**

FRIDAY

9:45 a.m.	**Opening of the Convention, Invocation and In Memoriam Resolution.**
10 a.m.	**Address by Pres. PAUL T. TRUITT.**
10:30 a.m.	**"Changing Policies in USDA," J. EARL COKE, Assistant Secretary of Agriculture.**
11 a.m.	**"Farm Prices and Production," Dr. T. K. COWDEN, Head, Dept. of Agricultural Economics, Michigan State College.**
11:30 a.m.	**Committees and Announcements.**
11:35 a.m.	**Annual Business Meeting. Election of eight members to Board of Directors.**
11:45 a.m.	**Adjournment. Golf and Tennis, Ladies' Events. After-Dinner Reception, courtesy—Southwest Potash Corporation.**

SATURDAY

9:45 a.m.	**"Congress and Farm Policy," Rep. CLIFFORD R. HOPE, (R.-Kan.), member of House Committee on Agriculture**
10:05 a.m.	**Presentation of Soil Builders Award.**
10:10 a.m.	**Panel—"Plant Food Potentials Across the Nation," Moderator: Dr. PAUL D. SANDERS, Editor, "The Southern Planter." Representing Northeast: LESTER H. SMITH, Extension Agronomist, Univ. of Vermont. Representing Southeast: H. A. WOODLE, Leader, Agronomy Extension Work, Clemson Agricultural College. Representing Midwest: Dr. ARNOLD W. KLEMME, Extension Specialist in Soils, Univ. of Missouri. Representing Far West: Dr. W. E. MARTIN, Extension Soils Specialist, Univ. of California.**
11:20 a.m.	**"Sharpening the Tools of Sales Management," H. H. MAYNARD, Chairman, Dept. of Business Organization, Ohio State University.**
11:45 a.m.	**Announcements and Adjournment. Golf and Tennis, Ladies' Events.**
6:30 p.m.	**Hospitality Hour, courtesy—Potash Co. of America.**
7:45 p.m.	**Banquet. Soloist—FELIX KNIGHT.**
9 p.m.	**Address by Rep. WALTER H. JUDD (R.-Minn.).**
10 p.m.	**Dancing.**

SUNDAY

9:30 a.m.	**Breakfast Meeting—Board of Directors.**

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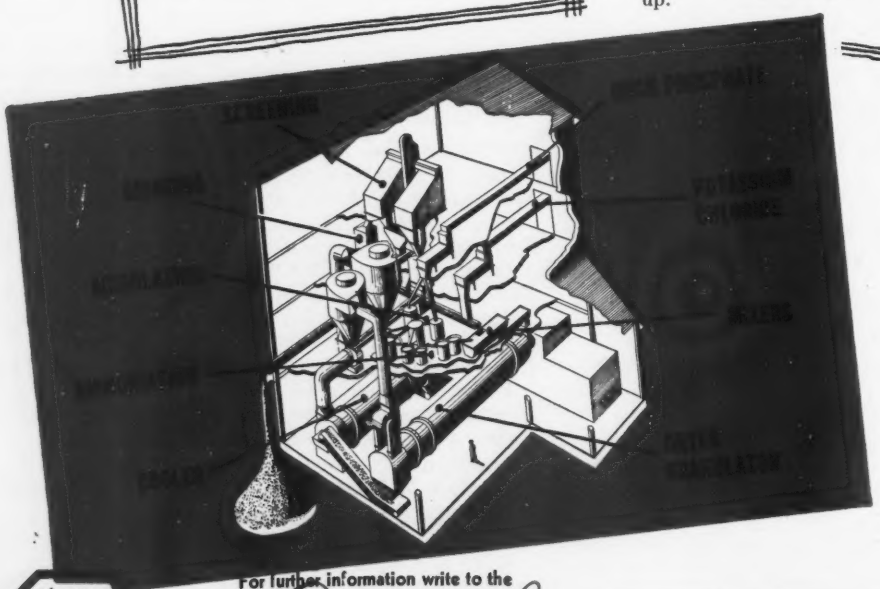

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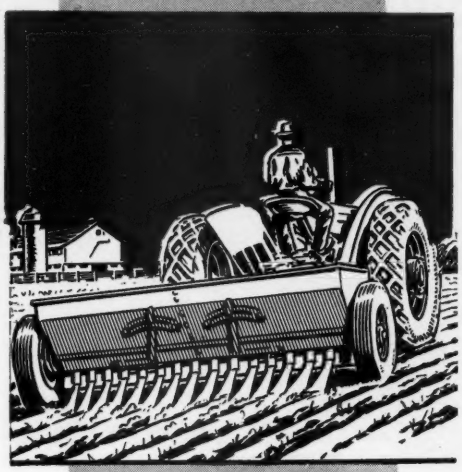
N%	P_2O_5%	K_2O%	
10	10	17	(sulfo-nitric acidulation)
11	11	11	" " "
10	15	20	(phospho-nitric acidulation)
12	15	18	" " "
12	12	20	" " "
14	14	14	" " "
10	20	20	" " "

COPPER SULPHATE

ZINC SULPHATE

BORON



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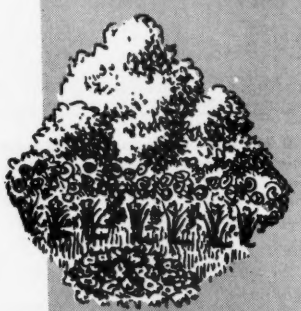

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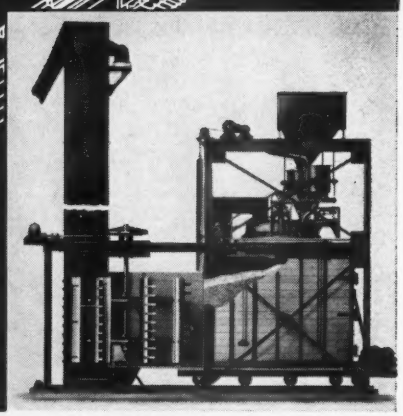

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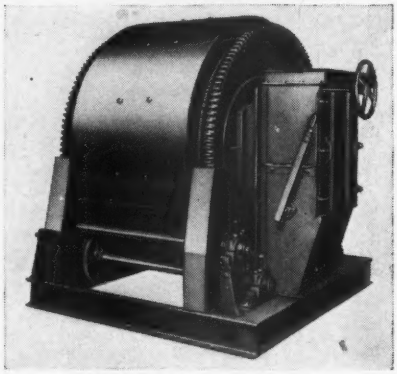

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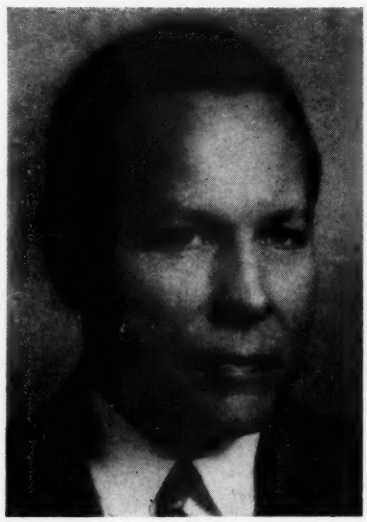
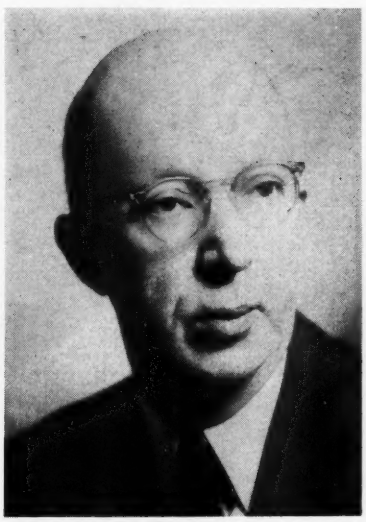


J. Earl Coke



H. H. Maynard

T. H. Cowden

agronomist at the University of Vermont, Burlington; H. A. Woodle, leader in agronomy extension work, Clemson Agricultural College, Clemson, S. C.; Dr. Arnold W. Klemme, extension specialist in soils at the University of Missouri, Columbia and Dr. W. E. Martin, extension soils specialist, University of California, Berkeley.

Opening the convention on Friday morning at 9:45, President Truitt will outline activities of the Plant Food Council during the past year.

After Coke's address, Dr. T. K. Cowden will discuss "Farm Prices and Production."

Cowden is head of the department of agricultural economics at Michigan State College. Annual business meeting of the Council will follow, with election of eight new members to the board of directors included.

Two farm magazine editors, winners in the Council-sponsored "Soil Builders Award for Editors" contest, will be honored on Saturday morning after Rep. Hope's speech.

The forum will follow, with a talk by H. H. Maynard, of Ohio State University, on "Sharpening the Tools of Sales Management" scheduled to wind up the session.

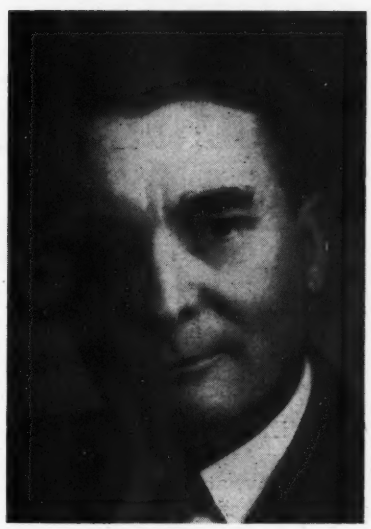
Golf and Tennis

Golf and tennis will be featured Friday and Saturday. Card parties and other events are scheduled for the ladies.

Southwest Potash Corp. will tender an after dinner reception Friday evening and Potash Company of America will hold a hospitality hour before the banquet Saturday.

Sunday's session will be confined to a breakfast meeting of the board of directors.

Members of the Council's executive and convention committees include Chairman James F. Doetsch, president of Chilean Nitrate Sales Corp.; John V. Collis, president of Federal Chemical Co.; George W. Gage, president and general manager of Anderson Fertilizer Co. Inc.; C. B. Robertson, president of Robertson Chemical Corp.; W. T. Wright, vice president of F. S. Royster Guano Co. and George E. Pettit, vice president of Potash Company of America (ex officio). ◆



Clifford R. Hope

Paul D. Sanders

Walter H. Judd

W. B. Camp

James E. Ferguson

R. Q. Parks

H. H. Tucker

June 15-17 . . .

Business and Pleasure For NFA at Greenbrier

THINGS will be normal at the National Fertilizer Association convention this year. That is to say, attendance again will break all records and an excellent group of speakers, representing agriculture, industry and government will highlight the sessions with talks on the fertilizer industry and its integral relationship with our nation's agriculture.

Even the location will be the same—the resplendent Greenbrier Hotel at White Sulphur Springs, W. Va. The convention, 28th annual one for the asso-

Hugh Moss Comer

True D. Morse

W. F. Price

ciation, will get underway June 15 and run for three days.

The NFA hasn't scheduled a "main" speaker for the convention; rather it has brought together a group of leaders in various phases of the industry and the economy it serves to present their views.

For 14 consecutive years fertilizer consumption has steadily mounted. What does the future hold? That was the question the association asked in a convention notice to its members.

Guest speakers at the convention, including Halleck as well as NFA officials, will attempt to answer the question.

All Rooms Booked

An indication of the widespread interest in the convention can be taken from the report from NFA headquarters sent out a month ago that all available rooms at the hotel already had been booked.

A panel discussion on "Efficient Water Utilization" is expected to attract a lot of attention on the interesting and varied program for the convention.

H. H. Tucker, director of the Coke Oven Ammonia Research Bureau will preside over the panel, which will include these members: W. B. Camp, of W. B. Camp & Sons, Inc., Bakersfield, Calif., an expert on both Western and Eastern irrigation problems; R. Q. Parks, manager of agricultural service for Grace Chemical Co., and James E. Ferguson, of the Sprinkler Irrigation Association, Washington, D. C.

The panel will be sponsored as an open meeting of the NFA Plant Food Research committee and will be held Monday.

The convention will be officially opened the following day, however, when Louis Ware, president of International Minerals & Chemical Corp. and NFA board chairman, calls it to order.

A government official who has excellent training and experiences to discuss the subject will follow with a speech on "The Solid Future for Agriculture." He is True D. Morse, under secretary of agriculture, in President Eisenhower's cabinet.

Rep. Halleck's talk, which will

National Fertilizer Association

PROGRAM

MONDAY

9:45 a.m. **Open Meeting—Plant Food Research Committee (*Aud.*). Topic: "Efficient Water Utilization."**
Chairman: H. H. TUCKER, Director, Coke Oven Ammonia Research Bureau, Columbus, O.
W. B. CAMP, W. B. Camp & Sons, Inc., Bakersfield, Calif.
R. Q. PARKS, Manager, Agricultural Service, Grace Chemical Co., Memphis, Tenn.
JAMES E. FERGUSON, Sprinkler Irrigation Association, Washington, D. C.

6:30 p.m. **Refreshment Hour—American Potash & Chemical Corp. (*President's Room*), H. J. Baker & Bro. (*Ballroom*).**

9 p.m. **Reception—Southwest Potash Corp. (*Va. Room*).**

TUESDAY

8 a.m. **Breakfast Meeting—Plant Food Research Committee (*Lee Room*).**

9:45 a.m. **Opening of Convention.**
Annual Address by Mr. LOUIS WARE.
"The Solid Future for Agriculture," TRUE D. MORSE, Under Secretary of Agriculture.
"Under New Management in Washington," Rep. CHARLES A. HALLECK, (R.-Ind.)

Festival Night

6 p.m. **Refreshment Hour—International Minerals & Chemical Corp. (*Ballroom*).**

7:30 p.m. **Annual Banquet; Entertainment.**

WEDNESDAY

9:45 a.m. **Annual Address by President RUSSELL COLEMAN.**
Panel: "Proper Use of More Fertilizer."
Moderator: ROY BATTLES, Assistant to the Master, The National Grange, Washington, D. C.
MILTON C. CUMMINGS, President, Farmers and Merchants State Bank, Effingham, Kan., representing the credit agencies.
WERNER L. NELSON, In Charge, Soil Fertility Research, School of Agriculture, North Carolina State College, Raleigh, Land Grant Colleges.
Dr. O. J. KELLEY, Soil Management Head, USDA.
W. F. PRICE, Plant Food Division, Swift & Co., Chicago, Ill., representing fertilizer industry.

Address: **"The New South," HUGH M. COMER, President, Avondale Mills, Sylacauga, Ala.**

12:30 p.m. **Adjournment.**

follow, is slated to be one of the most provoking on the program.

An Indiana representative since 1935, Halleck is majority leader of the House of Representatives, and is well qualified to talk on the subject, "Under New Management in Washington."

Halleck also held the majority leader's post in the Republican controlled 80th Congress.

Another panel to discuss "The Proper Use of More Fertilizer" will be heard on Wednesday.

The topic is especially appropriate in light of the recently issued USDA report on another record year of fertilizer consumption. (See page 45.)

It will be moderated by Roy Battles, assistant to the master of the National Grange. His panel members will include Milton C. Cummings, president of the Farmers and Merchants State Bank, Effingham, Kans., representing the credit agencies; Werner L. Nelson, in charge of soil fertility research at the school of agriculture, North Carolina State College, representing land grant colleges; Dr. O. J. Kelley, head of the Division of Soil Management, Irrigation and Dry Land Regions, USDA, Beltsville, Md., and W. E. Price, plant food division of Swift & Co., representing the fertilizer industry.

Following the panel delegates will hear a talk on "The New South" by Hugh M. Comer, president of Avondale Mills, Sylacauga, Ala.

Another view of the Greenbrier Hotel, White Sulphur Springs, W. Va., where National Fertilizer Association will hold its convention June 15–17.

President's Address

An address by NFA President Russell Coleman, summarizing the association's achievements during the past year and outlining plans for the future will lead off the program before the panel.

The usual varied social arrangements have been made by the NFA program committee to balance out the three-day event.

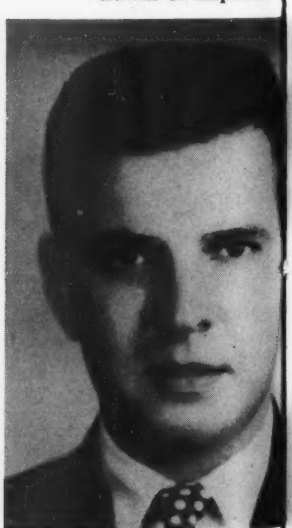
Included are a "Festival Night," the annual banquet, golf, tennis, horseshoe pitching, entertainment for the ladies and social hours sponsored by American Potash & Chemical Corp., H. J. Baker & Bro., International Minerals & Chemical Co. and Southwest Potash Corp. ◆

Charles A. Halleck

Werner L. Nelson

Roy Battles

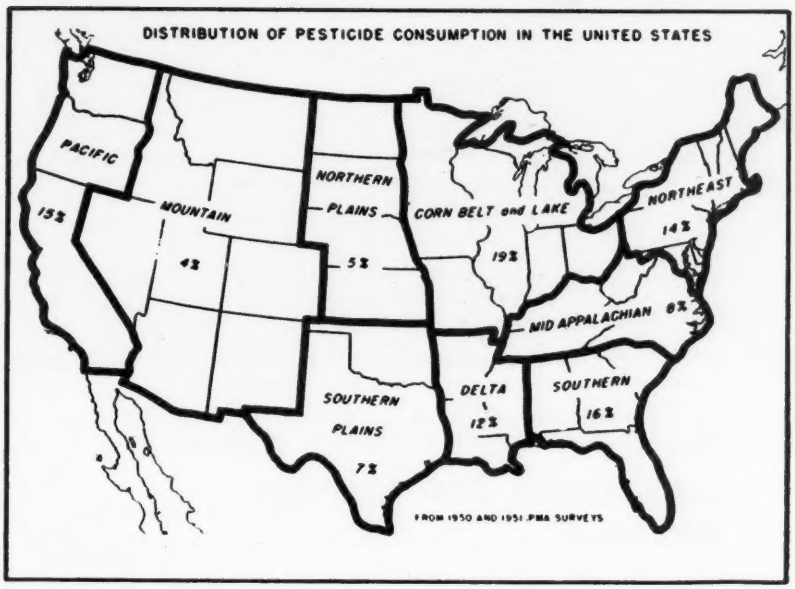
Edwin C. Kapusta



Pesticide Situation

for

1952-53



Prepared by Pesticides Staff,
Office of Materials and Facilities,
Production and Marketing Administration

Although FARM CHEMICALS *had to cut large portions of this report to make it fit limited space, we are presenting some of the more important points in the discussion of recent trends in farm chemicals as a service to our readers.*

P.M.A. credits the National Agricultural Chemicals Association, individuals in the industry and other bureaus of the USDA for help in preparing the report.

Publications of the Bureau of the Census, U. S. Department of Commerce, the Bureau of Mines, U. S. Department of the Interior and the U. S. Tariff Commission were consulted.

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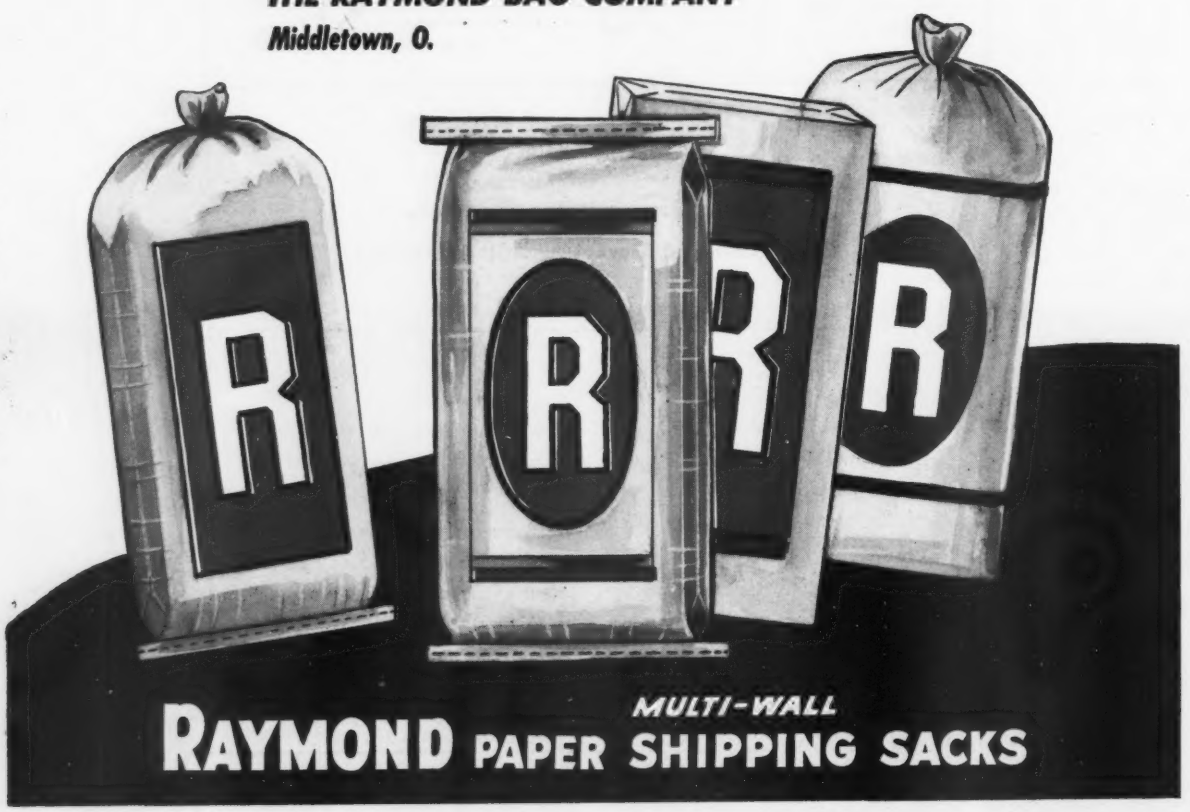

MULTI-WALL

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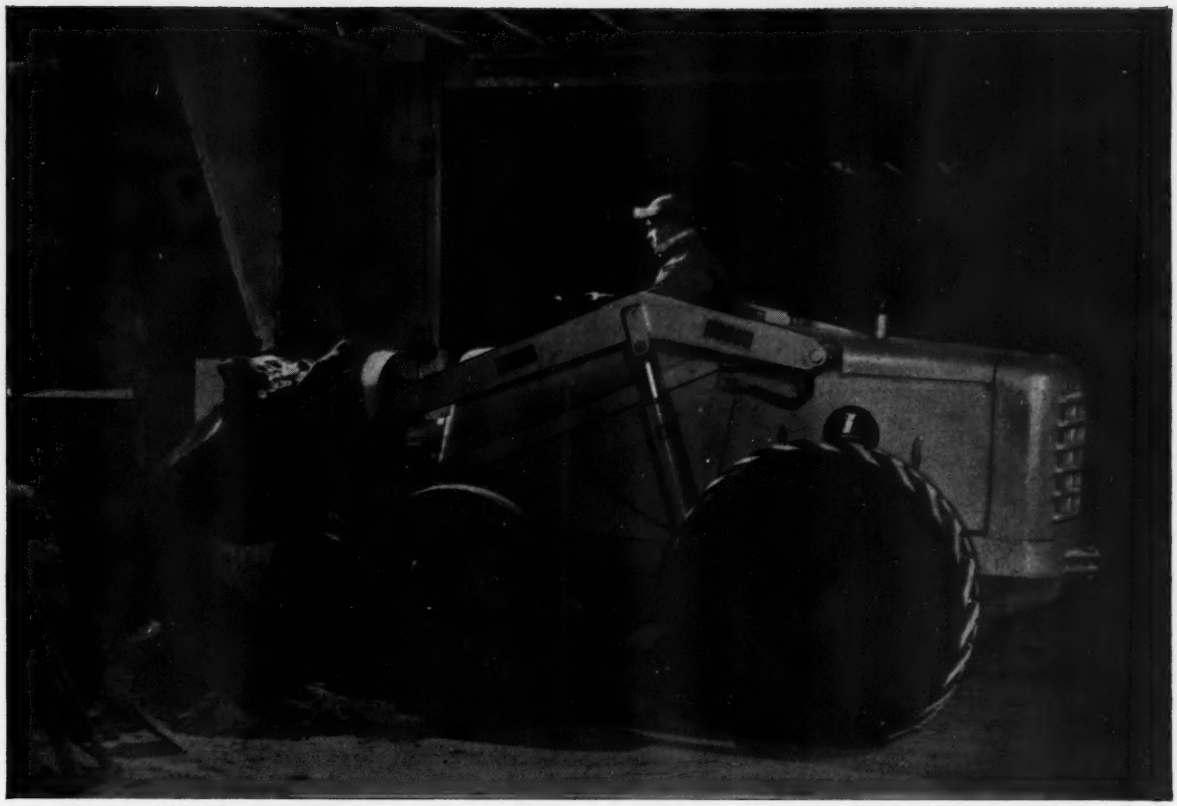

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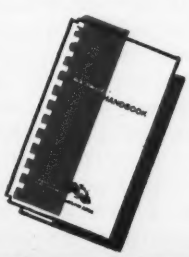

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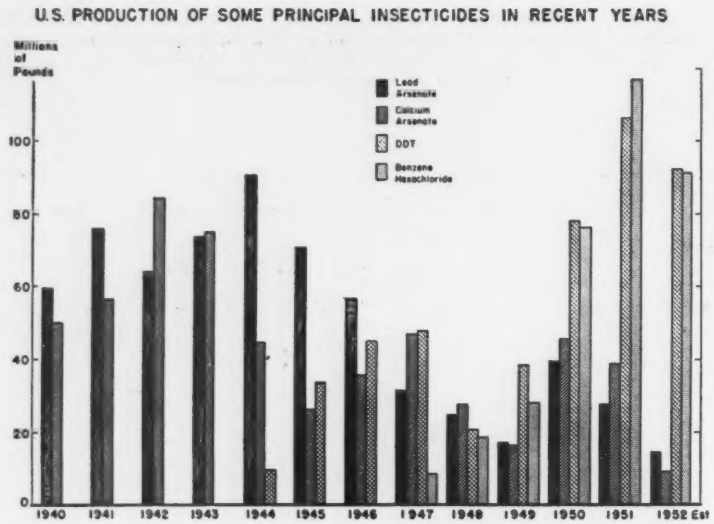

FIGURE 1. Trend in production of lead arsenate and calcium arsenate has been downward since the introduction of DDT and BHC, two major representatives of the newer synthetic organic insecticides.

A roundup of supply and demand for pesticides . . .

RECENT advances in technical knowledge of the use of pesticides have made it possible for farmers and the public to be well informed as to what materials to use, and when and how to apply them.

Yet little attention has been given heretofore to the determination of the quantitative need or demand for pesticides, although the annual cost to growers of chemicals now used to control pests is around one-half billion dollars.

The agricultural consumption of pesticides has grown enormously in the last six or seven years. At the end of World War II the pesticidal materials in general use were mostly inorganic chemicals, such as lead arsenate, calcium arsenate and copper compounds, and botanical products, such as rotenone, pyrethrum, nicotine and red squill. Beginning about 1945, a radical change occurred in the kinds and quantities of chemicals used as pesticides so that the pattern of consumption as late as 1944 is not at all like the present pattern (Fig. 1).

The new synthetic organic pesticides now available have made practicable and economically feasible the effective control of many pests which formerly were tolerated or only partially controlled. Although emphasis has shifted to the newer synthetic organic pesticides and these are preferred generally the older materials such as lead arsenate have been displaced only partially.

Despite the widespread demand for basic raw chemicals, it has been possible to maintain, and in certain cases to expand, production of pesticides so that adequate supplies of most materials have been available.

Much credit for this excellent record is due the pesticide industry. The National Production Authority contributed substantially through its implementation of programs to provide adequate supplies of the pesticides.

Studies were made in 1951 and 1952, under the sponsorship of the PMA State Committees and Insular Area Offices, to provide basic information from local agricultural sources for determining national requirements for major pesticides.

Representatives of the pesticide industry were consulted in many states.

The Agricultural Research Administration, through the Bureau of Entomology and Plant Quarantine, the Bureau of Plant Industry, Soils and Agricultural Engineering and the Bureau of Animal Industry; the Extension Service and the Bureau of Agricultural Economics —all in the United States Department of Agriculture—as well as the state agricultural experiment stations and state extension services, have contributed technical guidance to assist the Office of Materials and Facilities, PMA, in developing data relating to usage of, and requirements for, pesticides.

General Situation

Shortages of most pesticides were encountered in the 1950 season. It was anticipated that this situation would continue during 1951. Serious shortages did not develop, however, although the supply "pipeline" from the producers of basic pesticidal chemicals to the farmers was relatively empty throughout 1950 and the first half of 1951.

Facilities for producing the new synthetic organic pesticides in greatest demand were rapidly expanded by the industry during 1951 and 1952. Supplies generally were plentiful during the 1952 season.

This increased production resulted in an accumulation of large stocks of many important pesticides by the end of the season. Consumption was smaller during the 1952 crop year largely because of the prolonged drought over a great part of the country. Consequently, it is expected that supplies of most pesticides will be adequate to meet the needs for 1953.

Relatively large carry-over of pesticides, especially certain insecticides, from the 1952 season, may adversely affect subsequent supplies of some materials. Manufacturers of several basic chemicals which are used as insecticides have curtailed production and in some cases have suspended operations temporarily. Current rate of production of these materials, if maintained, would not be sufficient to meet estimated requirements.

Demand for pesticides produced in the United States for export to friendly nations has increased markedly in recent years. Although a normal export activity in pesticides assists in maintaining a vigorous industry capable of meeting maximum seasonal domestic needs during widespread outbreaks of pests, the foreign demand

for pesticides is a source of competition for available supplies.

Definition of Terms

The estimated annual requirement for each pesticide is a statement of the quantity needed to provide protection under conditions at least as severe as were encountered during the recent history of the particular pesticide.

Requirements for the 1953 crop year are preliminary and were estimated to show both the quantity believed necessary to provide protection under conditions of maximum over-all severity likely to be experienced, and the quantity for probable minimum pest conditions. These preliminary estimates of requirements are subject to revision when the reports become available from the states and insular areas on the quantities of pesticides estimated to have been used in 1952 and on estimated changes in state and area requirements for 1953. An estimate of requirements, therefore, is a forecast of the quantity which the chemical industry should be prepared to provide to meet reasonably heavy attacks, and should not be construed as a prediction of actual consumption which is largely dependent upon severity of pest conditions.

Domestic disappearance is calculated from production and inventory data for each material, corrected for exports and imports during the period.

The crop year, for the purpose of this study, is the period beginning October 1 of one calendar year and ending September 30 of the following year. This crop year generally corresponds to the period referred to by the manufacturers as the "pesticide year."

Many pesticides are produced by a single manufacturer or by no more than two or three manufacturers. In these cases production statistics are not published in order to avoid the possibility of revealing the operations of a single producer.

1953 Requirements

Quantity of pesticidal chemicals, excluding accessory components such as diluents, solvents and emulsifiers, estimated to have been used in 1935 was somewhat in excess of 215 million pounds.[1] The quantity estimated to have been used in 1944 had grown to approximately 513 million pounds.[2]

During the interval from approximately 1945 to 1953, at least 25 major pesticidal chemicals, which were not available before 1945, were introduced and have received wide acceptance. These newer chemicals have been used in substantial quantities each year, only partially displacing the older chemicals as pesticides. The quantity of pesticidal chemicals, including sulfur and copper sulfate, estimated to have been used in 1951 was approximately 1.025 billion pounds, and in 1952 may have exceeded this figure.

Table 1 shows recent trends in domestic disappearance of nine typical major pesticides during the last three crop years and estimated requirements for these materials during the 1953 season.

Reports on quantities estimated to have been used in 1952 are not yet available for comparison with domestic disappearance during that year when supplies for the most part were readily available.

Domestic disappearance of the newer synthetic organic pesticides such as BHC and 2, 4-D continued to increase, although the disappearance of DDT was somewhat lower in 1952 than in 1951.

Estimated requirements for the synthetic organic pesticides indicate that further growth in their use may be anticipated, although not at a rate as rapid as that which occurred during the last several years. The trend in disappearance of, and requirements for, the inorganic pesticides such as calcium arsenate and lead arsenate, which have been used for a relatively long time, generally is downward. Agricultural use of copper sulfate,

TABLE I.—Total Domestic Disappearance of Typical Pesticidal Chemicals for Crop Years 1950-52, and Revised Preliminary Estimates of Agricultural Requirements for Crop Year 1953

PESTICIDE	Disappearance, crop year			1953 Crop Year requirements	
	1950	1951	1952	Minimum	Maximum
	1,000 lb.	1,000 lb.	1 ,000 lb.	1,000 lb.	1,000 lb.
Benzene hexachloride[1]	71,235	80,000	92,224	80,000	95,000
Calcium arsenate	38,842	39,588	4,735	5,000	25,000
Copper sulfate[2]	124,573	122,449	110,097	85,000	100,000
2,4-D (acid basis)	17,600	23,494	25,298	28,000	32,000
DDT	57,638	72,688	70,074	70,000	85,000
Lead arsenate	27,490	30,174	17,452	18,000	30,000
Parathion	2,551	4,670	—	5,500	6,500
Sulfur, ground[3]	538,592	401,342	312,000	300,000	425,000
2, 4, 5-T (acid basis)	not available	2,822	2,937	3,500	5,000

[1]On the basis of 12 per cent gamma isomer content.
[2]All domestic consumption, including plant nutrient applications as well as a variety of small industrial and other uses; 1950 and 1951 figures are on a calendar year basis; 1953 requirements are agricultural only.
[3]Calendar year basis; the estimate for 1952 is preliminary.

TABLE 2.—Value of Production of Basic Pesticidal Chemicals, Crop Years 1940 and 1949-52[1]

Crop year	Producers' value	Crop year	Producers' value
	Dollars		Dollars
1940	35,000,000	1951	195,000,000
1949	110,000,000	1952	185,000,000
1950	155,000,000		

[1]Excluding accessory components. Figure for 1940 from Department of Commerce, figures for 1949–51 from industry sources and figure for 1952 estimated by Production and Marketing Administration.

[1]ROARK, R. C., Insecticides and Fungicides, Ind. and Eng. Chem. *27* (5): 530-532, 1935.
[2]Agricultural Statistics, 1945, USDA.

however, remains rather stable.

Value of Production

Although fluctuations occur in the kinds and quantities of particular pesticidal chemicals consumed, production generally has kept pace with the increasing demand. Table 2 shows growth in production of basic pesticidal chemicals, expressed in the value of products attained during recent years and the value of the comparable class of products in 1940.

The output of basic pesticidal chemicals increased in value each year from 1949 through 1951, thus reflecting increased production during these years. The value for 1952 decreased by about 10 million dollars from that in 1951, as a result of the reduced need for pesticides caused primarily by drought conditions in important agricultural areas.

The value of pesticidal chemicals at the producers' level in 1952, not adjusted to the current purchasing power of the dollar, was more than five times that of the pesticidal products in 1940.

TABLE 3.—DDT Production in the United States, 1944-52

Year	Production	Year	Production
	Pounds		Pounds
1944	9,626,000	1949	37,904,000
1945	33,243,000	1950	78,150,000
1946	45,651,000	1951	106,139,000
1947	49,600,000	1952	98,773,000
1948	20,240,000		

TABLE 4.—Production and Domestic Disappearance of DDT, Crop Years 1950-52 and Estimated Requirements, Crop Years 1951-53

Crop year	Production	Estimated requirements[1]	Domestic disappearance
	Pounds	Pounds	Pounds
1950	67,320,000	—	58,000,000
1951	97,875,000	85,000,000	73,000,000
1952	115,717,000	85,000,000	70,000,000
1953	—	Maximum 85,000,000	—
		Minimum 70,000,000	

[1]Includes all domestic requirements.

TABLE 5.—Benzene Hexachloride Production in the United States, 1947-52

Year	Benzene hexachloride[1]	Gamma isomer equivalent
	Pounds	Pounds
1947	8,197,000	—
1948	18,382,000	—
1949	27,937,000	3,787,000
1950	76,698,000	10,200,000
1951	116,988,000	17,100,000
1952	—	14,000,000 (est.)

[1]Gross production.

TABLE 6.—Production and Domestic Disappearance of Benzene Hexachloride (gamma isomer basis), by Crop Years, 1950-52 and Estimated Requirements, by Crop Years, 1951-53

Crop year	Production	Estimated requirements	Domestic disappearance
	Pounds	Pounds	Pounds
1950	8,688,000	—	8,549,000
1951	13,798,364	10,000,000	9,600,000
1952	16,302,752	11,400,000	11,067,000
1953	—	Maximum 11,400,000	—
		Minimum 9,500,000	

Synthetic Chlorinated Insecticides

A large proportion of the synthetic organic insecticides now in common use are chlorine derivatives. Several, particularly DDT, DDD, methoxychlor and benzene hexachloride, also require benzene in their manufacture. Both of these basic raw materials, chlorine and benzene, were in extremely short supply during late 1950 and much of 1951, but this situation eased markedly toward the beginning of 1952.

DDT—Production is shown by calendar years in Table 3. There are approximately 11 producers in this country who now have a total capacity to manufacture at least 160 million pounds of DDT annually.

Production of, and estimated requirements for, DDT during the past three crop years, are shown in Table 4 in comparison with domestic disappearance during the same periods.

Benzene Hexachloride—Production is shown by calendar years in Table 5. There are about 15 producers, and plant capacity now exists in this country to manufacture annually more than 21 million pounds of BHC (gamma isomer basis). Production, estimated requirements and domestic disappearance of benzene hexachloride (gamma isomer basis), by crop years, are shown in Table 6.

The quantity of **lindane** estimated to have been used for domestic purposes was approximately 600,000 pounds in 1951 and somewhat more than one million pounds in 1952. Domestic requirements for lindane are increasing, and production facilities are being expanded to meet the demand. A program of expansion of facilities

for manufacturing approximately five million pounds of lindane annually by 1955 has been authorized by the Defense Production Administration. Some of this increased production is expected to become available in 1953.

Toxaphene—Estimated requirements during the 1953 crop year are 50 to 75 million pounds. Quantities estimated to have been used by domestic agriculture were about 36 million pounds in 1950, 47 million pounds in 1951 and 35 million pounds in 1952. Toxaphene is produced by a single manufacturer. Although supplies were considerably short of domestic demand in 1950, this situation was improved in 1951. All needs were supplied in 1952 and it is expected that toxaphene will be readily available in 1953.

DDD—Domestic agricultural requirements for DDD, also called TDE, are growing steadily, and production facilities are being expanded. Estimated requirements for DDD for domestic agricultural use in 1953 are approximately five million pounds. Quantity estimated to have been used in 1951 was nearly 1.5 million pounds and in 1952 was somewhat less than 3.5 million pounds. Produced by a single manufacturer.

Methoxychlor—Less toxic to animals than DDT when absorbed in small quantities over extended periods. Produced by a single manufacturer. Supplies expected to be adequate to meet the present demand.

Aldrin and Dieldrin—Aldrin became available for commercial use as an insecticide in 1950,dieldrin in 1951. From relatively small usage during the early months of commercial production, the domestic agricultural consumption of aldrin and dieldrin has increased rapidly. Produced by a single manufacturer. Supplies expected to be adequate to meet the present demand.

The quantity of aldrin estimated to have been used by domestic agriculture during the 1950 crop year was nearly two million pounds, during 1951 probably somewhat less than three million pounds and during 1952 not more than about 2.5 million pounds. The quantity of dieldrin estimated to have been used by domestic agriculture was somewhat less than one-half million pounds during each of the 1951 and 1952 crop years.

Chlordane and **Heptachlor**—No problems of supply of either of these materials are expected during 1953. Produced by a single manufacturer.

Synthetic Organic Acaricides

Many synthetic organic chemicals with acaricidal properties have been developed to control mites on most major crops. These materials generally are specific against the mites, having little or no effect against insects. Examples of the synthetic organic acaricides are Aramite, Ovotran, Sulphenone and Neotran. These acaricides, as well as the organic phosphorus compounds discussed in the following section, are reported generally to control mites more effectively than sulfur. Supplies of these materials are expected to be adequate to meet the increasing demand.

Organic Phosphorus Compounds

Parathion and tetraethyl pyrophosphate are the best developed of the organic phosphorus insecticides.

TEPP—The requirements for the 1952 crop year were estimated to have been 1,250,000 pounds tetraethyl pryophoshate basis, equivalent to 3,125,000 pounds of the technical grade containing 40 per cent of tetraethyl pyrophosphate and 60 per cent of other organic phosphates. Several producers.

Parathion—Estimated domestic agricultural requirements for 1953 are 5,500,000 to 6,500,000 pounds. Produced by three manufacturers. Domestic disappearance at the producers' level during the 1950 season was 2,550,000 pounds and during 1951 was 4,670,-000 pounds.

Metacide is a mixture of 20 per cent parathion with 80 per cent of a dimethyl analog of parathion. Used for the control of certain crop pests. It is similar to parathion in its action.

EPN—Insecticide as well as an acaricide. EPN may be used for control of the citrus rust mite and tomato russet mite, which formerly could be controlled only through the use of sulfur. Produced by single manufacturer.

Malathon—Introduced commercially during 1952 for use particularly against mites on apples and pears. Also may be used to control the pear psylla and aphids on some fruits.

Systox—Short period during which this systemic product has been in commercial production has not provided sufficient experience on which to base estimates of domestic requirements.

Schraden—Available commercially only in liquefied-gas aerosols. Its safety for use on plants has been demonstrated only on carnations and roses. Reported to be effective against parathion-resistant mites.

Inorganic Insecticides

The inorganic chemicals in general use as insecticides at the present time are primarily lead arsenate, calcium arsenate and cryolite. Each of these insecticides, although less important than formerly, is used in substantial quantities and continues to be essential for protection of crops against destruction by insects.

Trend in production of lead arsenate and calcium arsenate during the period from 1940 to 1952 in comparison with that of DDT and benzene hexachloride, which became commercially available about the middle of this period, is shown in Figure 1.

Lead Arsenate—In 1944, the peak year of production, 90,706,000 pounds of lead arsenate were manufactured in the United States. Production, estimated requirements and domestic disappearance of lead arsenate for the crop years 1950–53 are shown in Table 7. Lead arsenate was in critically short supply for a few months late in 1951 and early in 1952 because of a shortage of lead. No shortage was encountered at the grower level during the 1952 season.

Calcium Arsenate—Production has decreased from the peak of 84,136,000 pounds reached in the calendar year 1942. Table 8 shows production, estimated requirements and domestic disappearance of calcium arsenate dur-

ing the last three crop years.

Cryolite—Estimated consumption of the insecticide grade of cryolite during the 1952 crop year was about two million pounds. Same quantity is estimated to be required for 1953. It is anticipated that the 1953 requirement will be met without serious difficulty.

Insecticides from Plant Sources

Insecticides obtained from plant sources are of particular interest, because generally they are of low toxicity to warm-blooded animals and most of them do not leave poisonous residues on treated crops at harvest.

The botanical insecticides, although among the oldest, still are widely used, and the control of certain insects is almost entirely dependent upon them.

Pyrethrum—Quantities of pyrethrum flowers imported into the United States during recent years are shown in Table 9. Imports were not adequate for all uses during 1950 and 1951. Allethrin, the synthetic pyrethrum-like chemical, became available from large-scale commercial production in 1952. With increased production of allethrin, continued imports of pyrethrum flowers at the present rate are expected to provide reasonably adequate supplies for 1953.

Allethrin—Quantity of allethrin produced during 1952, first full year of commercial production, was approximately 60,000 pounds. This quantity is roughly equivalent in insecticidal value to two-thirds of the pyrethrum imported during the year. Facilities for production of allethrin are being expanded. Currently produced by two manufacturers, with a third expected to provide additional production later.

Rotenone—Quantities of rotenone-bearing roots imported into the United States during recent years are shown in Table 10. It is expected that imports will continue to provide ample supplies of rotenone insecticides during 1953.

Ryania—Nearly one million pounds of 40 per cent ryania dusts were reported to have been shipped into Louisiana in 1952 for control of the sugarcane borer. Imports of ryania have been adequate to meet requirements, and no difficulty is anticipated in obtaining supplies in 1953.

Nicotine—Supplies expected to be adequate during 1953.

TABLE 7.—Production and Domestic Disappearance of Lead Arsenate, Crop Years 1950-52 and Estimated Requirements, Crop Years 1951-53

Crop year	Production	Estimated requirements	Domestic disappearance
	Pounds	Pounds	Pounds
1950	30,038,000	—	27,490,000
1951	32,106,000	37,000,000	30,174,000
1952	17,196,000	30,000,000	17,452,000
1953	—	Maximum 30,000,000 Minimum 18,000,000	—

TABLE 8.—Production and Domestic Disappearance of Calcium Arsenate, Crop Years 1950-52 and Estimated Requirements, Crop Years 1951-53

Crop year	Production	Estimated requirements	Domestic disappearance
	Pounds	Pounds	Pounds
1950	44,424,000	—	38,842,000
1951	48,885,000	51,000,000	39,588,000
1952	7,567,000	35,000,000	4,735,000
1953	—	Maximum 25,000,000 Minimum 5,000,000	—

TABLE 9.—Imports of Pyrethrum Flowers into the United States, Crop Years 1949-52

Crop year	Imports	Crop year	Imports
	Pounds		Pounds
1949	8,776,000	1951	7,076,000
1950	9,371,000	1952	6,641,000

TABLE 10.—Imports of Rotenone-bearing Roots into the United States, Crop Years 1949-52

Crop year	Imports	Crop year	Imports
	Pounds		Pounds
1949	6,402,000	1951	7,027,000
1950	9,846,000	1952	3,520,000

Sulfur

Ground Sulfur—Although large quantities of elemental sulfur are required for dusting crops to control insects, mites and fungus diseases, the domestic needs for 1953 are expected to be considerably less than they were in 1950 and in 1951. Table 11 shows the quantities of crude sulfur which were ground, and the exports and domestic disappearance of ground sulfur in the United States for the years 1950–52. Quantity of ground sulfur estimated to be required for domestic agricultural use during 1953 is between 300 and 425 million pounds.

It is expected that supplies of ground sulfur for pesticidal uses will be adequate to meet the needs during the 1953 season.

Liquid Lime-Sulfur—Still used rather extensively in the control of fungus diseases and scale insects, although the synthetic organic fungicides and the organic phosphorus insecticides now available have greatly reduced the demand for it. In view of the improved situation with respect to supplies it is expected that adequate quantities of lime-sulfur so-

lution will be available during the 1953 season.

Copper Fungicides

Copper chemicals are used more extensively than any other material, with the exception of sulfur, in the control of fungus diseases of plants. Copper fungicides are essential, not being satisfactorily replaced by any other materials, in the control of certain major diseases on a number of important crops.

Copper Sulfate—The domestic agricultural consumption of all copper-containing fungicides and plant nutrients on a sulfate basis, was estimated to have been 100,716,000 pounds in 1950 and 93,260,000 pounds in 1951. The requirement for these purposes in 1953 is estimated to be from 85 to 100 million pounds.

Adequate supplies of copper sulfate are being produced to meet both agricultural and domestic industrial needs. The copper sulfate situation in the United States during the years 1948–52 is shown in Table 12.

TABLE 11.—Ground Sulfur Supplies in the United States, 1950-52

Year	Crude sulfur ground	Exports[1]	Domestic disappearance[2]
	1,000 lb.	1,000 lb.	1,000 lb.
1950	645,650	107,000	538,592
1951	518,000	117,000	401,342
1952	458,000[3]	146,000[3]	312,000[3]

[1]Ground and conditioned sulfur, and sulfur contained in insecticidal mixtures. Quantities of conditioned sulfur and sulfur contained in insecticidal mixtures are estimated.
[2]For all domestic uses of ground sulfur.
[3]Estimated on basis of data for 10 months.

TABLE 12.—Copper Sulfate Supplies in the United States, 1948-52

Year	Production	Stocks at beginning of period	Imports	Exports	Domestic disappearance
	1,000 lb.	1,000 lb.	1,000 lb.	1,000 lb.	1,000 lb.
1948	193,400	20,400	136	84,269	106,067
1949	158,000	23,600	—	63,434	105,366
1950	174,600	12,800	1,872	60,299	124,573
1951	213,872	4,400	213	86,260	122,449
1952	189,016	9,776	—	85,979	99,186[1]

[1]Producers' stocks at the end of December, 1952 were 13,627,000 pounds.

Synthetic Organic Fungicides

A number of synthetic organic fungicides have become available within recent years.

Current production appears to be adequate generally to meet the growing demands anticipated for the 1953 season.

Dithiocarbamates—Several available commercially, particularly well adapted for certain specific uses. As a group, these are the oldest and perhaps the most widely used of the synthetic organic fungicides. Production amounted to about 11 million pounds in 1951, and it is estimated that it will exceed 16 million pounds in 1952. Estimated domestic agricultural requirement for the dithiocarbamate fungicides during the 1953 crop year is from 18 to 20 million pounds.

Dithiocarbamate fungicides in commercial production include ferbam, ziram, zineb, nabam and thiram.

Chloranil—Known also as Spergon. Produced by a single manufacturer. Supplies expected to be adequate during 1953.

Dichloro Naphthoquinone—Known also as Phygon or Phygon SL. A fungicide used for the foliage treatment of potatoes, tomatoes, beans, apples and cherries. It may be used also for seed treatment. Produced by a single manufacturer.

Glyoxalidine Derivatives—Crag Fruit Fungicide or Crag 341 is a glyoxalidine derivative recently made available as a fruit fungicide for the control of apple scab and cherry leaf spot. When used as a spray on apples, it is reported often to add to the coloring of the fruit.

Captan—Also known as Orthocide 406, can be used effectively and safely on nearly all seeds and most crops. Produced by a single manufacturer.

Organic Mercury Compounds—Widely used as fungicidal seed treatments and as soil disinfectants. Some are used as fruit fungicides. Almost three million pounds of mercury compounds were estimated to have been used during the 1951 season. Requirements during 1952 were estimated to have been about 16 per cent more than that quantity. Supplies are expected to be adequate to fill requirements for the mercury-containing pesticides during the 1953 season.

The quantities of mercury used by domestic agriculture primarily in pesticide manufacture during the period from 1942 to 1951 are shown in comparison with the total domestic consumption in Table 13.

Weed Killers and Defoliants

Herbicides, defoliants and plant hormones have come into widespread use during recent years.

2, 4-D—Demand continues strong. Current plant capacity to produce 2, 4-D exceeds 26 million pounds annually, on an acid basis. Six manufacturers producing 2, 4-D. Production figures for 1950–52 are shown in Table 14. Estimated domestic requirements for the crop years 1951–53 are shown in Table 15 in comparison with


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disappearance data for the crop years 1950–52.

2, 4, 5-T—Particularly effective against woody plants. Plant capacity for producing 2, 4, 5-T currently is approximately 6.4 million pounds (acid basis) annually. However, manufacturing facilities for production of 2, 4, 5-T and 2, 4-D are largely interchangeable. Produced by four manufacturers. Production figures for 1950–52 are shown in Table 14. Estimated domestic requirements for the crop years 1951–53 are shown in Table 16 in comparison with domestic disappearance.

Sodium Chlorate—Highly effective as a general weed killer for use in situations where it is desired to kill all plant growth.

The approximate distribution of sodium chlorate for herbicidal and defoliant uses in 1952 is shown in Table 17. Although sodium chlorate is used for a number of industrial and defense purposes, the estimated requirements for herbicidal and defoliation uses should be met without serious difficulty.

Calcium Cyanamide—Used extensively to defoliate cotton, especially in the areas where dew occurs regularly. Also used to defoliate castor beans and potatoes. Produced by a single manufacturer. Production facilities appear to be adequate to supply the present demand.

Borates—Borate compounds which include borax and other sodium salts, such as sodium pentaborate, are effective herbicides against many kinds of weeds. Quantity of the borate compounds reported to have been used for herbicidal and defoliant purposes during 1952 was about 15 million pounds. Based on present information, it is believed that the requirements during 1953 will be approximately the same as quantities used in 1952.

TCA—Effective as a selective weed killer against certain perennial grasses, such as Johnson grass, quack grass and Bermuda grass. Agricultural requirements probably amount to less than 25 per cent of total production. TCA production during the 1951 calendar year (acid, salts and esters) was 9,247,000 pounds.

Dinitro Compounds—Effective contact and pre-emergent herbicides. Quantity of dinotro compounds reported to have been used in 1951 was approximately two million pounds. Although no estimate of usage is yet available, it was expected that approximately 25 per cent more would have been required in 1952 than in 1951. Two principal producers.

Ammonium Sulfamate—Known also as Ammate. Nonse-

TABLE 13.—Mercury Consumption in the United States, 1942-51

Year	Domestic Consumption	
	All uses	Agricultural uses
	Pounds[1]	Pounds[1]
1942	3,777,000	117,000
1943	4,142,000	152,000
1944	3,260,000	299,000
1945	4,745,000	218,000
1946	2,398,000	238,000
1947	2,704,000	427,000
1948	3,515,000	536,000
1949	3,029,000	355,000
1950	3,740,000	342,000
1951	4,320,000	588,000

[1]The data are compiled from statistics in terms of flasks of 76 pounds each.
Source: Minerals Yearbook for the years indicated, except for 1950 and 1951 which are from preprints of Minerals Yearbook for those years, Bureau of Mines, U. S. Department, Interior.

TABLE 14.—United States Production of 2, 4-D and 2, 4, 5-T (acid basis) 1950-52

Year	Production	
	2, 4-D	2, 4, 5-T
	Pounds	Pounds
1950	14,156,000	—
1951	20,826,000	2,456,000
1952	28,121,000	3,398,000

Source: Production in 1950 from United States Tariff Commission; production in other years from producers' reports.

TABLE 15.—Estimated Domestic Requirements for 2, 4-D (acid basis) Crop Years 1951-53 and Disappearance, Crop Years 1950-52

Crop year	Requirements	Domestic disappearance
	Pounds	Pounds
1950	—	17,600,000
1951	22,000,000	23,494,000
1952	28,000,000	25,298,000
1953	Maximum 32,000,000	—
	Minimum 28,000,000	

Table 16.—Estimated Domestic Requirements for 2, 4, 5-T (acid basis), Crop Years 1951-53 and Disappearance, Crop Years 1951-52

Crop year	Requirements	Domestic disappearance
	Pounds	Pounds
1951	2,000,000	2,822,000
1952	6,000,000	2,937,000
1953	Maximum 5,000,000	—
	Minimum 3,500,000	

lective weed killer particularly effective in the killing of poison ivy and poison oak. Produced by a single manufacturer. Supplies expected to be adequate during 1953.

Monosodium Cyanamide—Effective cotton defoliant, used as either a dust or spray. Produced by a single manufacturer.

IPC—Herbicide effectively used against germinating seeds and young seedling stages of annual grasses and related weed plants. First available commercially in 1946. Quantity used during 1952 was only approximately 150,000 pounds.

CIPC—Also known as Chloro IPC. Herbicide used to control certain broad-leafed weeds and annual grasses in cotton and onions. Longer residual life in the soil than IPC. CIPC is coming rapidly into considerable demand for control of weeds in cotton.

2, 4-Dichlorophenoxyethyl Sulfate—Sodium salt of 2, 4-dichlorophenoxyethyl sulfate is a recently introduced herbicide. Commercially available for the first time during the 1952 season. Produced by a single manufacturer.

Naphthaleneacetic Acid—The growth-regulating chemical, naphthaleneacetic acid and its salts, is used for thinning fruit blossoms and as a harvest spray to prevent abnormal dropping of fruit. Also applied to stored root crops, particularly potatoes, to prevent sprouting. Approximately 40,000 pounds of naphthaleneacetic acid and salts were estimated to have been used during 1951.

Sodium Arsenite—General weed killer. Quantities, expressed as arsenic trioxide, estimated to have been used largely in weed-killer applications were about 3.6 million pounds in 1950 and about 4.5 million pounds in 1951.

TABLE 17.—Herbicidal and Defoliant Use of Sodium Chlorate in 1952

Use	Percentage of total	Estimated quantity
	Per cent	Pounds
Weed control		
In agricultural areas	55	24,100,000
On railway and other rights-of-way	30	13,125,000
For defoliation of cotton	15	6,525,000
Total		43,750,000

Grain and Soil Fumigants

Fumigants are gas-forming chemicals used against insects, nematodes and certain other organisms.

Liquid Grain Fumigants—Chemicals which are used in liquid grain fumigant mixtures, particularly carbon tetrachloride and carbon disulfide, were acutely short in the autumn of 1950 and during the early months of 1951. The immediate critical needs for liquid grain fumigant mixtures were alleviated at that time by special shipments made voluntarily by the manufacturers and later through directives issued by the National Production Authority.

Production now appears to be adequate, and the agricultural needs for liquid grain fumigants are being met without serious difficulty.

Domestic consumption of liquid grain fumigants was estimated to have been 2,653,000 gallons in 1950 and 2,674,000 gallons in 1951. The estimated requirements for these materials during 1953 amount to 3,000,000 gallons.

Carbon tetrachloride is used in practically all liquid grain fumigant mixtures, primarily because it suppresses inflammability of other ingredients in the mixture, and may therefore be considered the basic material for liquid fumigant mixtures.

Carbon disulfide is a highly inflammable liquid used as one ingredient in liquid grain fumigant mixtures. It is employed also as a soil fumigant to kill certain soil-infesting insects, nematodes and fungi and to a lesser extent as a weed killer, and fumigant for rodents. The chemical has many industrial uses, and is a basic raw material in the manufacture of some other pesticides. The quantity of carbon disulfide estimated to have been used in 1951 by domestic agriculture for purposes other than in liquid grain fumigant mixtures was 3,932,000 pounds. This compares with 6,000,000 pounds reported by the manufacturers to have been sold during the same year for agricultural purposes including use in liquid grain fumigants.

Ethylene dichloride is used in liquid grain fumigant mixtures with carbon tetrachloride, and is used also to control the peach tree borer. The quantity of ethylene dichloride estimated to have been applied in 1951 by domestic agriculture for pesticidal purposes, excluding use in liquid grain fumigants, was 10,122,000 pounds. Production has been adequate for industrial and agricultural needs, and it is anticipated that adequate supplies of ethylene dichloride will be available in 1953.

Soil Fumigants—In addition to its use in liquid grain fumigants, carbon disulfide is used as a soil fumigant. Other major chemicals employed as soil fumigants are ethylene dibromide and chlorinated propane derivatives.

Ethylene dibromide is a heavy liquid applied to the soil to control nematodes and the immature stages of certain insects. The estimated agricultural requirements for ethylene dibromide during 1952 were 7.5 million pounds, and for 1953 are nine million pounds. See Table 18.

Chlorinated propane derivatives (such as D-D Mixture) are liquid mixtures containing dichloropropane and dichloropropene that are used in soil treatments for the control of nematodes and insects.

Production has kept pace with the growing demand, and it is anticipated that adequate supplies will be available for 1953.

Chloropicrin, another volatile liquid, is used as a soil fumigant, as well as in some grain fumigant mixtures. The quantity reported to have been used in 1951 for agricultural purposes was about 153,000 pounds.

Methyl bromide is a liquefied gas used effectively for soil fumi-

gation, particularly of tobacco seed beds, for treating stored food products such as grain and dried fruits and for fumigating baled cotton to control the pink bollworm.

Production has kept pace with the growing demand and supplies should be adequate for needs in 1953.

Hydrocyanic acid, one of the best known fumigants for the control of insects, is a highly dangerous gas from the viewpoint of both animal and plant life.

Adequate quantities of hydrocyanic acid have been available for agricultural use, and no supply problems are expected in 1953.

Animal Medicinals

Phenothiazine—Widely used as a vermifuge for removal of internal parasites from certain farm animals. Present information indicates that adequate supplies will be available for the 1953 season.

Sodium Fluoride—Formerly used in large quantities as an insecticide to control cockroaches and poultry lice. At the present time, sodium fluoride is readily available and is expected to continue so.

Accessory Components

The pesticidal chemicals referred to in the foregoing sections, with only a few exceptions, must be mixed or processed into suitable formulations of different strengths, combinations and physical characteristics, before they can be applied for specific purposes by farmers.

Formulation Types

Five general types of pesticidal formulations are employed in combating pests: **Dusts, wettable powders, emulsion concentrates, solutions** and **aerosol mixtures.** Dusts are applied, as the name implies, as dry powders; wettable powders, emulsion concentrates and solutions are applied as liquid sprays and aerosols are applied as fogs by means of liquefied-gas propellants or mechanical generators, or as smokes by means of heat or chemicals. Each type of pesticidal formulation requires certain accessory components capable of producing the desired performance. ◆

TABLE 18.—Production and Estimated Agricultural Consumption of Ethylene Dibromide, 1949-51

Year	Production	Agricultural consumption	Percentage of production consumed by agriculture
	Pounds	Pounds	Per cent
1949	97,400,000	1,700,000	1.8
1950	101,000,000	3,700,000	3.7
1951	110,000,000	4,500,000	4.1

TABLE 19.—Quantities of Some Diluent Materials Used in Manufacturing Pesticidal Mixtures, 1948-51

Year	Talc, pyrophyllite and ground soapstone	Fuller's earth	Kaolin	Bentonite
	1,000 lb.	1,000 lb.	1,000 lb.	1,000 lb.
1948	145,400	37,498	31,900	6,168
1949	122,200	74,684	29,912	7,312
1950	154,000	139,856	82,692	7,696
1951	180,836	172,678	80,000	8,000

Source: Preprint of Minerals Yearbook 1950, except data for 1951 which are from Minerals Market Report No. 2114 and No. 2139, Bureau of Mines, U. S. Department of the Interior.

Question and answer panel at fertilizer safety conference is pictured at right. SEATED, from left, F. Wayne High, Baugh Chemical Co.; E. F. Carnell, Davison Chemical Corp.; chairman A. B. Pettit, Davison Chemical Corp.; G. F. Dietz, Fertilizer Manufacturing Co-operative. STANDING, vice chairman John S. Roszel, Mathieson Chemical Corp.; Donald Allen, Virginia-Carolina Chemical Co.

Fertilizer Safety Men Answer Key Questions

KEY representatives of the fertilizer industry heard how they can make their plants safer and more efficient at a fertilizer plant safety session in Baltimore, Md., May 8. The session was part of the Maryland Governor's Safety-Health Conference and Exhibit.

The men heard safety discussed from both an industry and an employe viewpoint, then held open discussion periods to take up specific safety problems confronting them in their fertilizer plants.

A. B. Pettit, supervisor of industrial health and safety for Davison Chemical Corp., was chairman of the session, with John S. Roszel, manager of industrial relations at Mathieson Chemical Corp., assisting.

Management Viewpoints

Speaking from the management point of view, E. O. Burroughs Jr., manager of the insurance department at F. S. Royster Guano Co., talked about "Housekeeping in Fertilizer Manufacturing Plants."

Burroughs' talk, an excellent roundup of the many advantages of various safety tips, has become quite popular at recent safety meetings and has been widely praised by safety men.

In it he mentioned increased production, improved employe relations and more profitable operations which can result from good housekeeping.

Burroughs told of visiting a fertilizer plant in the far South which over the past 15 years has been outstanding in its safety record.

"Things were clean when I arrived and just as clean at the close of the day. The superintendent announced that they had set a record for tonnage production," he said.

Burroughs said the heart of the maintenance program is the mechanical staff and its supply of repair parts. He illustrated his talk with posters showing bad housekeeping practices in fertilizer plants and various remedies.

"I am certain," he concluded

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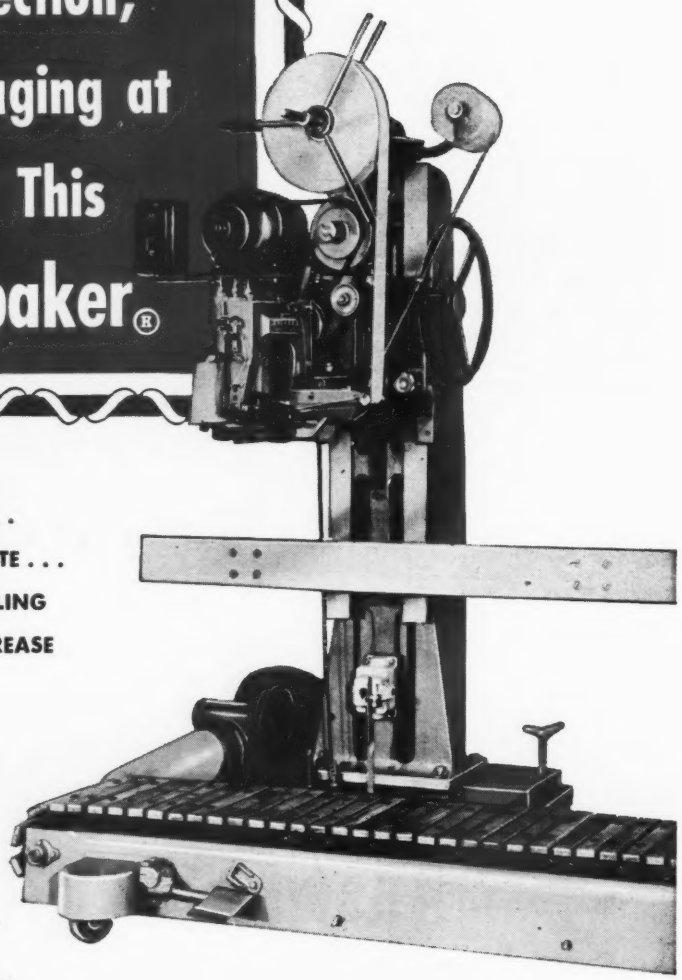

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LION OIL COMPANY

EL DORADO, ARKANSAS

W. N. WATMOUGH JR., vice president of Davison Chem. Corp., talks on safety duties of management.

"that a good housekeeping program will pay its way in the complete operation of the plant and also result in a profit for the owners."

From Worker's Side

Giving the worker's side of safety in fertilizer plants was Bernard T. Hartlove, president of Local 12138, United Mine Workers, at Mathieson Chemical Corp.

"Plant workers don't like to have safety principles preached to them," he declared, in calling upon personnel in charge of safety programs to work with employes in setting up safety precautions.

"You must accept suggestions from the workers—the ones who get hurt in a plant—if you want a successful program," he added.

Hartlove stressed the point that foremen must teach workers by example and not by instructions only if safety precautions are to be carried out.

What if a worker continually ignores safety measures? Hartlove was asked.

"Talk to him and try to show him the benefits of the regulations," Hartlove suggested, "but take him off the job if he won't listen."

Highlight of the one-day session, attended by more than 50 fertilizer safety personnel, was a question and answer panel which handled problems submitted by representatives. An open discussion period followed.

Panel members were F. Wayne High, manager of operations at the Baugh Chemical Co., Baltimore; E. F. Carnell, superintendent of Davison Chemical Corp. at Savannah, Ga.; Donald Allen, superintendent of the Virginia-Carolina Chemical Co. plant at Portsmouth, Va. and George F. Dietz, safety director for Fertilizer Manufacturing Cooperative, Baltimore, Md. Pettit was moderator.

Questions and Answers

Some of the more important questions, and the answers given by panel members, follow:

Question: *What are the best type dock boards and how can they be made secure?*

Carnell—The tendency of a worker to grab the first available material to use as a dock board should be discouraged. Dock boards should be light and movable with shoulders that assure a safe, snug fit.

Q: *What precautions should be taken with anhydrous ammonia?*

Dietz—While unloading, a canister gas mask should be used. A respirator should be nearby for use on employes exposed for long periods of time to NH_3.

Q: *Are companies in the fertilizer industry paying the cost of prescription goggles for their workers?*

Allen—Most companies aren't, but some are paying part of the cost.

Q: *What is the safe way to store ammonium nitrate?*

Carnell—After the Texas City disaster the Fire Underwriters set up regulations for the material, including the following:

1. Bags should be stored at least five feet from other material and should be stacked 10 bags high, with tiers of six bags wide and 30 bags long.

2. A handling aisle of 10 feet, every 100 feet, should be maintained.

3. Be exceptionally careful in rebagging broken sacks of ammonium nitrate to keep foreign material out.

Q: *How can you keep workers interested in safety?*

Dietz—Vary the program, tell workers what the safety rules are and why and use displays and other promotional material to keep safety constantly before the workers.

BERNARD T. HARTLOVE, union president at Mathieson, speaks on worker's side of safety programs.

Q: *Are members of our industry paying part of the cost of safety shoes?*

Dietz—Most don't pay anything, a few pay part cost. Some plants don't require safety shoes, often because of employe reluctance to wear them.

William N. Watmough, vice president of Davison Chemical Corp., addressed the group briefly at the afternoon meeting. A leader in the drive for fertilizer safety and a keynote speaker at the first fertilizer safety meeting, Watmough praised Pettit for his work and called on all representatives to help sell safety to the smaller plants in the industry, who he said can't afford to be without it.

Watmough emphasized starting from the top in organizing a safety program in any plant, large or small.

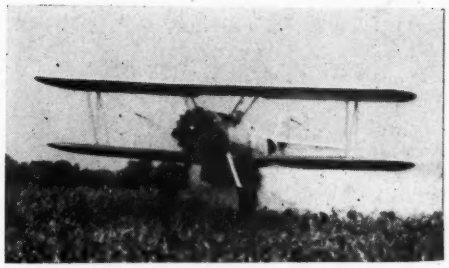
"The program must have enthusiastic backing from top management if it is going to catch on with the workers," he stated.

He said the foreman in any plant is an important cog in the safety promotion setup. "The foreman can start a safety program, but he must stand behind it," Watmough cautioned.

Many delegates watched demonstrations on safety between sessions of the fertilizer meetings which were held in the Lord Baltimore Hotel.

Formulator, farmer profit:

Spraying Small Tobacco Plots From the Air



SMALL TOBACCO plots—ranging from one to 10 acres—are being sprayed successfully from the air in northwest Missouri. And the operation, which assures nearly 100 per cent control, is proving profitable for both the chemical firm that put up the spray, Woodbury Chemical Co. of St. Joseph, Mo., and the farmer.

Why is such a small-scale operation proving profitable?

The spray operation dates back to the summer of 1951 when the tobacco crops around Weston, Mo. suffered a serious infestation of Tobacco Horn Worms.

For many years farmers were using a Paris Green mixture which they thought was the only material capable of controlling the pest.

But because the Paris Green was very scarce, the Horn Worms were winning the battle.

Horn Worms Strike

In the summer of 1951 the tobacco crop was fully grown when the worms struck, and they were much larger than those in previous years.

Because of the risk of hurting the crop, farmers couldn't get into the field to spray.

H. A. Woodbury, president of Woodbury Chemical, got numerous calls from tobacco farmers requesting an effective spray. Like many other chemical officials, Woodbury thought it would be useless and impractical to attempt chemical control of the insects.

In discussing this article by Sandra Chamberlain, of St. Joseph, Mo., H. A. Woodbury, of Woodbury Chemical Co., said "it seems to us that the unusual fact is that it is very difficult to spray plots from one to three acres. However, because of the fact that the entire industry seemed to be doing the spraying, it proved to be very profitable for the operator and to ourselves as chemical manufacturers."

The farmers, however, were not discouraged. They came to the Woodbury Chemical office, bringing tobacco infested with worms to show the destruction being caused by the Horn Worm.

Woodbury finally agreed to have a chemical prepared for spraying from a plane, and obtained a local flyer, George Boyd, to fly the area. Only about 25 acres near De Kalb, Mo. were sprayed in late summer.

Results were virtually 100 per cent control of the Horn Worm, with plans made to enlarge the spray operation the next summer.

The chemical which proved so successful for the treatment of the tobacco worm contained one-half gallon of 25 per cent TDE mixed with two gallons of water for treating one acre.

The excellent results were duplicated last summer.

Requests Repeated

Early in the year Woodbury got the old familiar pleas for materials to spray the small plots. At first Boyd wasn't interested because of the high per-acre cost of operation.

As the season advanced, the increasing number of inquiries received and acres available for spraying influenced the flyer, coupled with a light year for commercial flyers generally.

Response was widespread. Before the end of the season more than 2,000 acres had been sprayed. Best results were obtained by using as little as one to two quarts of TDE per acre according to degree of infestation.

Unique arrangements for spraying were made between the farmers and Boyd.

The farmer would call into the flyer's office, location of his field. Then he would place a white flag on a pole on the plot he wanted sprayed so Boyd could identify it from the air.

Hence, although plots were small, the flyer could work continually during the day.

The tobacco harvest was delayed until all the tobacco farmers had their plots sprayed with TDE. In fact, business was so good Boyd had to call in another flyer to help with the job.

This year Woodbury Chemical is prepared to expand the airplane spraying of small tobacco plots still further. To date the company received orders for spraying more than 800 acres during the summer, some farmers asking for as many as three sprayings of their plots. ◆

How You Can Get

Free Information

On each of the two postage-paid postcards below you can request further information on four items described on this and the Industrial News section of this issue. ***Fill out one quarter section for each item in which you are interested.***

6-4 Surfactants Bulletin

A description of the powerful wetting and penetrating qualities of Udet F surfactants is given in a new technical bulletin published by Universal Detergents, Inc. The surfactants are used for speeding up production and improving conditioning in ammoniated fertilizers. The company says Udet F helps make a more intimate contact of the sulfuric acid with rock phosphate. **Code Number 6-4.**

6-5 Industrial Silos

Several companies in the farm chemicals industry are using industrial silos built by Marietta Concrete Corp. A recent company bulletin outlines reasons why many more should be using the equipment for storage. Phosphate rock is just one of many products stored in the silos which are individually designed by Marietta. **Code Number 6-5.**

6-6 Water Soluble Fertilizer

If your company is manufacturing water soluble fertilizers or is contemplating a move in that direction you will be interested in a complete report on the subject prepared by Monsanto Chemical Co. The booklet gives scores of facts and figures which you will want to know about the field. Advantages of using water soluble fertilizers are given, both from the manufacturer's point of view and from that of the user. **Code Number 6-6.**

6-7 Malathon

A description of Malathon, the insecticide that takes up where DDT and other materials leave off, is described in literature from American Cyanamid Co. The phosphatic pesticide is effective in controlling resistant fly infestations, the company reports. Another feature is its low order of mammalian toxicity. **Code Number 6-7.**

6-8 Transportometer Line

Weighing, integrating and regulating the flow of materials in your plant all can

Use card at right to get information on products and bulletins. For additional requests write FARM CHEMICALS on company stationery, giving appropriate Code Numbers.

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- 6-2 Belt Conveyor Carrier
- 6-3 New Emulgates
- 6-4 Surfactants Bulletin
- 6-5 Industrial Silos
- 6-6 Water Soluble Fertilizer
- 6-7 Malathon
- 6-8 Transportometer Line
- 6-9 Jacketed Fittings
- 6-10 Kraft-lok Bags
- 6-11 Ammonium Sulfate
- 6-12 Davco Superphosphate
- 6-13 Mineral Salts
- 6-14 Mathieson Pesticides
- 6-15 Bemis Bags
- 6-16 Sulfoxide Booklet
- 6-17 Copper Sulfates
- 6-18 Systemic Bulletin

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be done with a modern transportometer, Sintering Machinery Corp. advises in a new bulletin describing its line of conveying equipment. The unit is produced in three basic models, depending on the requirements of your plant and the setup of existing equipment. **Code Number 6-8.**

6-9 Jacketed Fittings

A complete new line of jacketed pipe fittings for use on welding is described in a recent booklet put out by Red Jacket Co., Inc. The fittings are described in detail, with all measurements and specifications. The company says they have numerous applications in industrial plants and are available in sizes from one to 12 inches in several weights. **Code Number 6-9.**

6-10 Kraft-lok Bags

They fill better and they're cleaner—those are two advantages claimed by Kraft for its new Kraft-lok multiwall paper bags. Descriptive literature says you can save money and speed up production by using the Kraft-loks with your own standard belt packer. The new development involves a special valve closing device which prevents spilling and leakage. **Code Number 6-10.**

6-11 Ammonium Sulfate

Phillips ammonium sulfate has many advantages, literature from the chemical company states. Among others, it's dry-cured to make sure that it has no excess moisture and is free flowing. Because it has uniform crystals the material won't cake, the company adds. Full information on availability and price can be obtained by using **Code Number 6-11.**

6-12 Davco Superphosphate

Three-way control is offered by Davison Chemical Corp. with its granulated superphosphate. The granulation feature assures storage control without caking, application control with no dusting and food control because it supplies plant food at a uniform rate. These added points assure sales with its product, Davison claims. For fuller information use **Code Number 6-12.**

6-13 Mineral Salts

Increasing attention is being given these days to addition of minerals with the regular NPK mixes. In line with this thinking, Tennessee Corp. advises use of its mineral salts to stimulate sales of your formulations. The company offers information on how to increase fertilizer tonnage and profits by addition of minerals. **Code Number 6-13.**

6-14 Mathieson Pesticides

A full line of technical insecticides is described in literature from Mathieson Agricultural Chemicals Co. Included are specifications for 9-gamma BHC dust base, 9–15 BHC-DDT dust base, 12–14 gamma technical BHC, 36-gamma BHC and 50 per cent DDT dust base. For complete information on the line of pesticide materials use **Code Number 6-14.**

6-15 Bemis Bags

Convenience of plant location is one of the biggest features of Bemis Bags, the company says in describing its line. In addition to quick delivery the company offers trained packaging specialists who can help you solve the packaging problems in your plant. **Code Number 6-15.**

6-16 Sulfoxide Booklet

Powerful sulfoxide-pyrethrin insecticide formulations are described in a new booklet prepared by S. B. Penick & Co. Specifications for the synergist Sulfoxcide (R) are given along with information on the sulfoxide-pyrethrin concentrates. Uses of sulfoxide for aerosols, stock sprays, grain protectants and insect powders also are given in the literature. **Code Number 4-5.**

6-17 Copper Sulfates

If you are making sprays, dusts or fertilizers you should check up on the copper sulfates manufactured by Phelps Dodge Refining Corp. for those products. Company literature says dusts and mixes are more effective when prepared with Triangle Brand Basic Copper Sulphate and the proper diluent. **Code Number 4-20.**

6-18 Systemic Bulletin

The systemic insecticide OMPA (Schraden) which was given recent approval for spray applications to control aphids and spider mites on ornamentals, is described in a new technical bulletin from Monsanto Chemical Co. The material, which is absorbed by a plant and distributed throughout its system, now is available in commercial quantities. **Code Number 6-18.**

Reader Service inquiries will be honored up to six months after date of publication of the magazine in which they appear.

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Fertilizer Consumption

in the United States

1951-52

By

WALTER SCHOLL and H. M. WALLACE

Division of Fertilizer and Agricultural Lime
Bureau of Plant Industry, Soils and Agricultural Engineering
Agricultural Research Administration
U. S. Department of Agriculture
Beltsville, Maryland

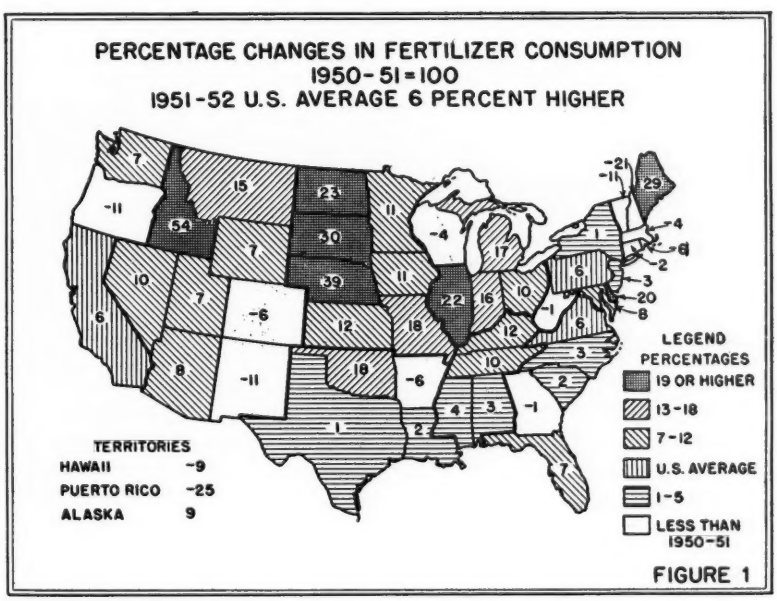

FIGURE 1

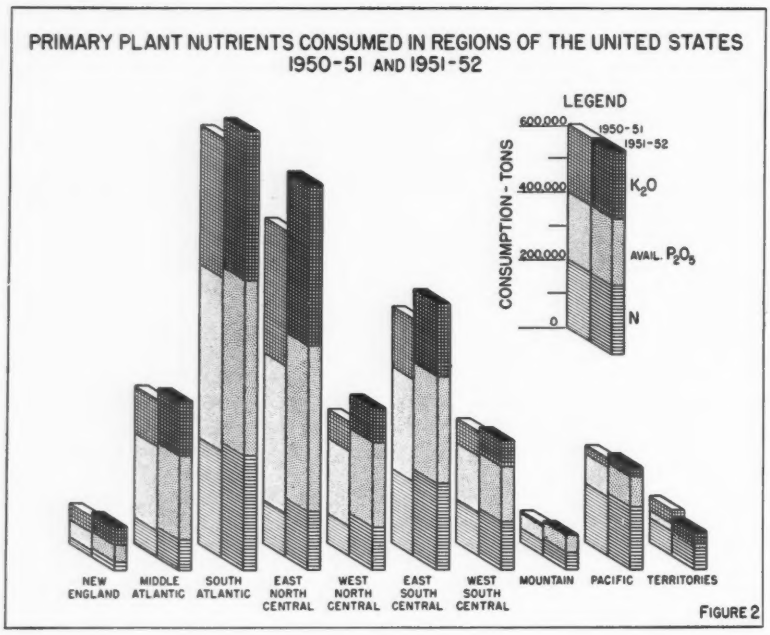

FIGURE 2

Figures show rise of seven per cent over previous year

ANOTHER record for fertilizer consumption and an increase over the previous year of nearly seven per cent was made in the United States and its territories in the year ended June 30, 1952.

The 13th annual survey shows that consumption of fertilizers totaled 22,432,418 tons during the year.

Of this total mixed fertilizers, amounting to 15,086,349 tons, constituted 67.3 per cent. Materials containing one or more primary plant nutrients (N, P_2O_5, K_2O) totaled 6,561,019 tons, or 29.2 per cent and secondary and minor element materials amounted to 785,050 tons, or 3.5 per cent.

Consumption of all fertilizers was 1,441,024 tons or 6.9 per cent greater than the revised total (20,991,394 tons) for 1950-51[1].

Increases in consumption of these classes were for mixed fertilizers 1,107,967 tons (7.9 per cent), materials containing primary nutrients 194,276 tons (3.1 per cent), and secondary and minor element materials 138,781 tons (21.5 per cent) greater than their respective consumption in 1950–51.

Fertilizers consumed in 1951–52 contained a total of 5,205,623 tons of primary plant nutrients consisting of nitrogen 1,424,780 tons, available P_2O_5 2,199,376 tons and K_2O 1,581,467 tons. These quantities represented a net increase for nitrogen of 187,803 tons (15.2 per cent), for available P_2O_5 89,476 tons (4.2 per cent) and for K_2O 201,654 tons (14.6 per cent) over 1950–51. Total content of P_2O_5 in all fertilizers consumed was 2,678,070 tons. The weighted average total primary nutrient content in all commercial mixtures consumed in 1951–52 was 24.86 per cent as compared with 24.19 per cent in 1950–51.

The Survey

Presented herein are eight tabulations and two figures designed to show the quantities, kinds and grades of fertilizers and their primary plant nutrient content which were consumed in the United States and territories during the year ended June 30, 1952.

Included are certain comparisons with earlier years. These tabulations were prepared from reports submitted to the Division of Fertilizer and Agricultural Lime, by manufacturers, showing number of tons of fertilizer shipments for consumption in agriculture throughout the 48 states and the territories.

Supplementary information was furnished by the state fertilizer control officials and agronomists. All of this assistance is gratefully acknowledged. The word "ton" means short ton.

State Consumption

Table 1 shows total tonnages of mixtures and all materials (including secondary and minor element materials) consumed in each state, Hawaii, Puerto Rico and Alaska. Consumption in other territories was negligible. Changes in consumption of fertilizers and of primary nutrients are in percentage of 1950–51, as the base year. These data are presented together in this table to facilitate direct comparisons.

Changes in consumption of all fertilizers that contain only primary nutrients are shown in Fig. 1 by states. Increases generally were highest in the North Central states where 6,301,511 tons of 28.1 per cent of all fertilizers were consumed. These states accounted for 821,354 tons (57.0 per cent) of the national increase of 1,441,024 tons. In the Southern states, comprising the states of the South Atlantic and South Central regions, consumption amounted to 11,058,695 tons or 49.3 per cent of the total and accounted for 384,097 tons (26.6 per cent) of the increase.

The Western states, consuming 2,161,751 tons or 9.6 per cent of all fertilizers, accounted for 218,882 tons (15.2 per cent) and the Northeastern states, comprising the states of New England and the Middle Atlantic regions, consuming 2,530,240 tons or 11.3 per cent

accounted for 117,290 tons (8.1 per cent) of the increase. Consumption in the territories amounted to 380,221 tons or 1.7 per cent of all fertilizers consumed and was 100,599 tons less than for 1950–51.

Consumption of mixed fertilizers increased in 38 states and decreased in 10. Use of materials increased in 25 states and decreased in 23. Greater use of mixed fertilizers accounted for most of the national increase in consumption of fertilizers. Consumption of most of the more important individual materials increased over that for 1950–51, but that of superphosphate decreased, resulting in only a slight net increase in the total consumption of all materials.

Mixtures

Table 2 lists the 164 grades consumed in the Continental U. S. in 1951–52, in amounts of 2,500 tons or more and their consumption in 1950–51. These grades accounted for 14,469,229 tons (95.91 per cent) of the total consumption, 15,086,349 tons, of mixtures in 1951–52. Nine of them accounted for 50 per cent. Other grades, numbering 984, totaling 250,961 tons, and approximately 200 to 300 special grades, not listed by their guaranteed analysis and totaling 88,314 tons, also were consumed. In addition, 277,845 tons, not included in Table 2, were consumed in the territories.

Use in Territories

Grades consumed in the territories are not included in Table 2 because those consumed in Hawaii were reported as fractional numbers of the minimum percentages of nutrients and the principal grades consumed in Puerto Rico were not of the kinds generally used in the Continental U. S. Although the number of grades listed in 1951–52 totaled 1,148 and in 1950–51, only 992, it does not necessarily follow that there actually were 156 more grades used in 1951–52.

There was, apparently, no substantial increase or decrease in the actual number consumed in the two periods. A large part of the 156 was caused by manufacturers listing more grades by their guarantees than were listed in 1950–51.

The 164 grades listed in Table 2 represent 104 different ratios of primary nutrients. Of this number 12 represent 74.9 per cent of the total tonnage of mixed fertilizers consumed in the continental U. S. These are listed in Table 2a. The four leading grades consumed in the Continental U. S. were 3–12–12 (1–4–4), 5–10–5 (1–2–1), 5–10–10 (1–2–2) and 3–9–6 (1–3–2). These were the nutrient ratios most favored in this country.

The 15 principal grades consumed in each region during the current year are listed in Table 3, with their consumption in each of the respective states of the region. With the exception of Florida and Nevada these grades represent more than 60 per cent of the total mixed fertilizers consumed in each state. Except for these two states and a few Western states, these 15 grades accounted for 80 per cent or more of the total state consumption.

Regional Consumption

Consumption of each class of mixture in the various regions is shown in Table 5. With the exception of the West North Central and Mountain regions, 83 per cent or more of all mixtures consumed were N-P-K mixtures. In the Mountain region, N-P mixtures were consumed in the largest amount (60 per cent) whereas in the West North Central region such mixtures, although consumed in a large amount, were only 18 per cent of the total as compared with 74 per cent for N-P-K mixtures. Relative proportions of the classes consumed in the Continental U. S. have not changed greatly over many years. In 1941[2], they were N-P-K 92 per cent, P-K six per cent, N-K one per cent and N-P less than one per cent. In 1951–52, they were 89, 8, 1 and 2 per cent, respectively.

Primary Nutrients

Weighted average primary nutrient content of all mixed fertilizers consumed in each state is shown in Table 7. National average for all mixtures increased from 24.19 per cent in 1950–51 to 24.86 per cent in 1951–52. This average, in 1951–52, comprised nitrogen 4.30, available P_2O_5 11.14 and K_2O 9.42 per cent. Values for

TABLE 2a.—Principal Ratios of Primary Nutrients of Mixed Fertilizers Consumed in the Continental U. S. Year Ended June 30, 1952

Ratio	Consumption[1]	Proportion of Quantity of All Mixed Fertilizers
	Tons	Per Cent
0-1-1	784,797	5.30
1-1-1	572,168	3.86
1-2-1	1,025,841	6.93
1-2-2	1,709,354	11.54
1-3-2	1,024,571	6.92
1-3-3	501,610	3.39
1-4-2	756,126	5.10
1-4-4	2,541,223	17.16
1-6-3	512,083	3.46
2-4-3	534,118	3.61
2-5-3	622,084	4.20
4-10-7	508,254	3.43
Total....	11,092,229	74.90

[1]Includes all grades having these ratios.

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UREA

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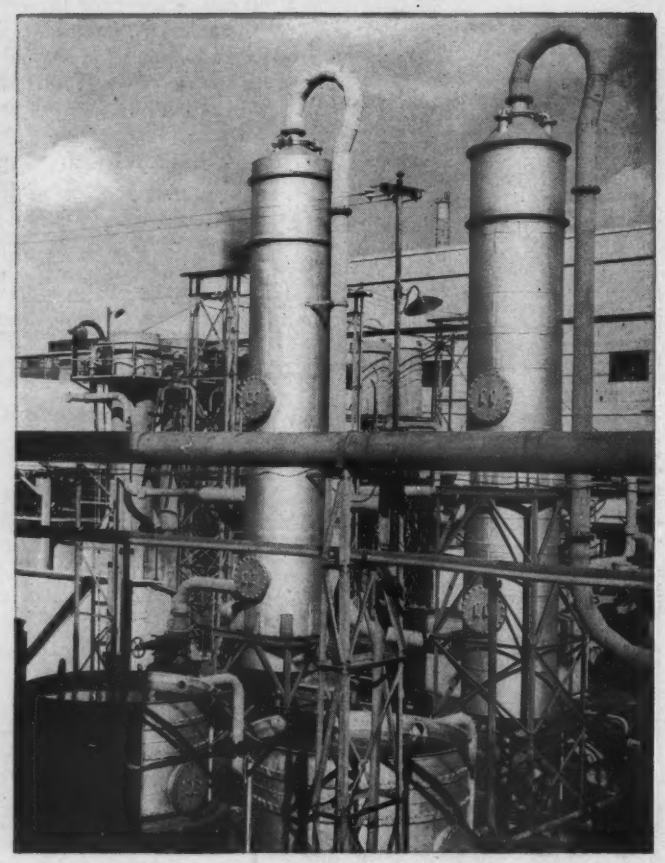

This Chemico-built Urea plant of Sumitomo Chemical Co. Ltd. in Niihama, Japan is in full commercial production. Expansion to three times its present capacity is now under way.

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Chemico plants are profitable investments

Table 1. - Consumption of Fertilizers, Year Ended June 30, 1952[1/]

State & Region	Mixtures			Materials			All Fertilizers 1951-52	Relative Consumption 1950-51 = 100	
	July 1 - Dec. 31, 1951	Jan. 1 - June 30, 1952	Total	July 1 - Dec. 31, 1951	Jan. 1 - June 30, 1952	Total		Fertilizers [2/]	Total N, Avail. P_2O_5, & K_2O
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Percent	Percent
Maine	22,370	179,088	201,458	4,714	6,359	11,073	212,531	129	131
New Hampshire	2,233	12,915	15,148	1,325	4,549	5,874	21,022	79	78
Vermont	11,757	26,892	38,649	8,697	8,803	17,500	56,149	89	95
Massachusetts	9,795	64,453	74,248	5,142	12,689	17,831	92,079	96	93
Rhode Island	1,480	12,865	14,345	600	1,794	2,394	16,739	94	99
Connecticut	5,601	52,947	58,548	6,336	22,350	28,686	87,234	98	100
New England	53,236	349,160	402,396	26,814	56,544	83,358	485,754	106	109
New York	97,983	388,629	486,612	40,239	108,066	148,305	634,917	101	103
New Jersey	47,925	193,086	241,011	7,127	16,844	23,971	264,982	103	104
Pennsylvania	166,811	401,005	567,816	33,534	63,505	97,039	664,855	106	110
Delaware	15,020	59,089	74,109	1,917	4,361	6,278	80,387	120	124
District of Columbia	367	1,364	1,731	204	606	810	2,541	117	120
Maryland	77,281	190,024	267,305	9,490	20,131	29,621	296,926	108	110
West Virginia	15,607	57,528	73,135	7,472	19,271	26,743	99,878	99	101
Middle Atlantic	420,994	1,290,725	1,711,719	99,983	232,784	332,767	2,044,486	105	107
Virginia	179,560	560,167	739,727	29,362	99,822	129,184	868,911	106	109
North Carolina	251,590	1,319,604	1,571,194	81,055	288,930	369,985	1,941,179	103	104
South Carolina	115,391	602,910	718,301	58,118	202,712	260,830	979,131	102	105
Georgia	162,942	890,265	1,053,207	64,470	183,434	247,904	1,301,111	99	103
Florida	384,392	589,173	973,565	48,359	68,127	116,486	1,090,051	107	105
South Atlantic	1,093,876	3,962,119	5,055,994	281,364	843,025	1,124,389	6,180,383	103	105
Ohio	315,931	667,510	983,441	24,010	42,096	66,106	1,049,547	110	113
Indiana	244,941	689,233	934,174	54,678	94,383	149,061	1,083,235	116	119
Illinois	185,113	407,094	592,207	418,938	423,203	842,141	1,434,348	122	141
Michigan	165,527	350,933	536,560	15,337	39,024	54,361	590,921	117	119
Wisconsin	73,523	277,235	350,358	16,102	26,803	42,905	393,763	96	101
East North Central	1,005,235	2,392,005	3,397,240	529,065	625,509	1,154,574	4,551,814	114	119
Minnesota	37,768	133,434	171,202	18,157	35,747	53,904	225,106	111	114
Iowa	66,744	211,102	277,846	58,964	90,118	149,082	426,928	111	117
Missouri	121,120	306,710	427,830	110,715	214,560	325,265	753,095	118	125
North Dakota	5,150	16,325	21,475	2,215	7,458	9,673	31,148	223	226
South Dakota	1,210	4,423	5,633	2,225	3,436	5,661	11,294	130	130
Nebraska	6,338	25,502	31,940	23,788	38,808	62,596	94,436	139	154
Kansas	37,126	47,460	84,586	62,891	60,213	123,104	207,690	112	112
West North Central	275,456	744,956	1,020,412	278,955	450,330	729,285	1,749,697	116	122
Kentucky	77,672	405,280	482,952	59,336	87,931	147,167	630,119	112	121
Tennessee	77,957	365,370	443,327	57,805	101,728	159,533	602,860	110	121
Alabama	132,902	737,373	870,275	204,213	268,121	472,334	1,342,609	103	106
Mississippi	25,684	345,249	370,933	197,528	257,157	454,695	825,628	104	109
East South Central	314,215	1,353,272	2,167,487	518,982	714,947	1,233,729	3,401,216	106	112
Arkansas	14,997	173,171	188,068	40,713	129,960	170,673	358,741	94	94
Louisiana	29,315	150,768	180,083	50,475	99,778	150,253	330,336	102	109
Oklahoma	12,514	52,504	65,018	51,120	56,517	107,637	172,655	118	121
Texas	64,967	228,614	293,481	162,478	159,405	321,883	615,364	101	107
West South Central	121,693	604,957	726,650	304,786	445,660	750,446	1,477,096	101	105
Montana	709	2,570	3,279	8,116	11,848	19,964	23,243	115	112
Idaho	192	11,425	11,617	14,395	47,220	61,615	73,232	154	154
Wyoming	49	622	671	1,459	4,626	6,085	6,756	107	106
Colorado	876	19,707	20,583	7,401	19,547	26,948	47,531	94	95
New Mexico	466	1,054	1,520	5,318	12,242	17,560	19,080	89	93
Arizona	5,957	18,386	24,343	42,989	49,275	92,164	116,507	108	109
Utah	333	2,246	2,579	11,617	16,437	28,054	30,633	107	107
Nevada	143	498	641	1,474	3,597	5,071	5,712	110	107
Mountain	8,725	56,508	65,233	92,669	164,792	257,461	322,694	111	111
Washington	5,231	21,491	26,722	25,212	39,714	64,926	91,648	107	114
Oregon	4,635	15,663	20,298	40,717	59,293	100,010	120,308	89	92
California	78,153	136,200	214,353	606,615	806,133	1,412,748	1,627,101	106	105
Pacific	88,019	173,354	261,373	672,544	905,140	1,577,684	1,839,057	104	104
Continental U. S.	3,381,448	11,427,056	14,808,504	2,805,062	4,438,631	7,243,693	22,052,197	107	111
Hawaii	29,990	25,545	55,535	28,334	31,312	60,146	115,681	91	92
Puerto Rico	121,965	100,228	222,193	23,562	18,222	41,784	263,977	75	82
Alaska	1	116	117	0	446	446	563	109	108
Territories	151,956	125,889	277,845	51,896	50,480	102,376	380,221	79	85
Total U. S., 1951-52	3,533,404	11,552,945	15,086,349	2,856,958	4,489,111	7,346,069	22,432,418	106	110
1950-51[3/]	3,384,456	10,593,926	13,978,382	2,940,994	4,072,018	7,013,012	20,991,394	100	100
1949-50	2,648,560	9,649,036	12,297,596	2,261,020	3,784,684	6,045,704	18,343,300	88	86

1/ Includes: Ground phosphate rock, basic slag, secondary and minor element materials, such as, borax, sulfur, manganese sulfate, etc. Used as separate materials, also fertilizer distributed by Government agencies. Does not include liming materials, but includes gypsum.

2/ Excludes materials not guaranteed to contain the primary plant nutrients, N, P_2O_5, or K_2O. Their quantities are shown in Table 4.

3/ Revised, additional information for Nevada shows consumption in 1950-51 should have been:

	78	695	773	1,074	1,922	2,996	3,769	--	--

these nutrients respectively were 0.12, 0.11 and 0.44 higher than in 1950–51.

Variations in States

Although the national average for each nutrient increased over that for 1950–51, changes by states and territories showed variations. Average for nitrogen increased in 40 of these areas, decreased in nine and in three there was no change. Available P_2O_5 increased in 18 and decreased in 34, while K_2O increased in 44 and decreased in eight.

The national average reflected the general trend in the change in composition of mixed fertilizers during the past years. In 1943–44[3], the average nutrient content of all mixed fertilizers was 20.84 per cent, comprising 3.71 for nitrogen, 10.38 for available P_2O_5 and 6.75 per cent for K_2O. In this survey the values for these nutrient contents were nitrogen 4.30, available P_2O_5 11.14 and K_2O 9.42, a total of 24.86 per cent. These respective nutrients were 15.9, 7.3 and 39.6, and the total 19.3 per cent greater than in 1943–44.

Table 2. – Consumption of Principal Mixed Fertilizers in the Continental United States, By Grades, Years Ended June 30, 1952 and 1951

Grade	Consumption		Proportion of Total		Grade	Consumption		Proportion of Total	
	1952	1951	1952	1951		1952	1951	1952	1951
	Tons	Tons	Percent	Percent		Tons	Tons	Percent	Percent
0-8-24	4,510	5,710	.03	.02	5-20-10	19,612	29,611	.13	.22
0-9-27	35,000	49,928	.24	.37	5-20-20	41,045	28,778	.28	.21
0-10-10	4,535	4,652	.03	.03	6-2-6	22,189	23,179	.15	.17
0-10-20	61,760	26,014	.42	.19	6-4-6	6,361	9,367	.04	.07
0-10-20	22,922	18,567	.16	.14	6-4-6	10,634	13,710	.07	.10
0-10-45	3,023	0	.02	.00	6-6-10	3,630	1,011	.03	.01
0-12-12	191,120	144,349	1.29	1.06	6-6-6	2,900	671	.02	<.01
0-12-20	26,057	22,550	.16	.17	6-6-6	70,350	34,837	.48	.26
0-12-36	4,243	5,777	.03	.04	6-6-6	19,732	15,759	.13	.12
0-14-5	3,901	5,496	.03	.04	6-6-9	9,105	29,063	.06	.21
0-14-7	141,054	142,509	.95	1.04	6-6-12	6,245	4,639	.04	.03
0-14-10	43,515	115,825	.29	.85	6-7-7	4,454	4,075	.03	.03
0-14-14	329,421	234,776	2.22	1.72	6-8-4	230,586	260,783	1.56	1.91
0-15-15	16,175	9,476	.11	.07	6-8-6	263,563	263,851	1.78	1.93
0-15-20	3,310	0	.02	.00	6-8-6	269,655	218,334	1.82	1.60
0-16-8	6,241	3,808	.04	.03	6-8-12	43,625	54,644	.30	.40
0-16-16	6,926	0	.05	.00	6-9-2	6,401	7,067	.04	.05
0-20-10	41,248	60,331	.28	.44	6-8-8	13,743	10,261	.09	.08
0-20-20	231,247	217,162	1.56	1.59	6-8-9	9,779	8,869	.07	.07
0-30-15	3,842	2,155	.03	.02	6-9-12	69,548	41,963	.47	.31
2-6-10	6,204	3,362	.04	.02	6-10-4	61,580	53,975	.42	.40
2-10-6	7,310	214	.05	<.01	6-12-4	6,252	3,416	.02	.03
2-12-6	317,886	588,484	2.15	4.31	6-12-6	55,867	41,443	.38	.30
2-12-12	402,717	321,012	2.72	2.35	6-12-12	136,468	80,287	.92	.59
2-16-8	13,401	28,764	.09	.21	6-20-20	3,248	3,884	.02	.03
3-6-6	3,735	4,452	.03	.03	6-24-6	25,896	16,220	.16	.12
3-6-5	13,865	20,044	.09	.15	6-24-12	10,830	12,837	.07	.09
3-8-8	27,331	26,872	.18	.20	6-24-24	3,242	782	.02	.01
3-9-6	800,236	856,177	5.40	6.28	6-30-0	3,101	4,042	.02	.03
3-9-9	407,638	349,478	2.75	2.56	7-7-7	37,206	35,705	.25	.26
3-12-12	45,454	32,721	.25	.24	8-8-8	15,194	17,332	.10	.13
3-9-15	4,571	2,904	.03	.02	8-8-24	21,826	9	.15	<.01
3-6-18	183,389	203,851	1.24	1.49	8-8-4	3,392	249	.02	<.01
3-8-27	79,571	23,229	.54	.17	8-8-8	11,667	1,458	.08	.01
3-10-10	8,680	3,281	.04	.02	8-8-2	2,979	2,823	.02	.02
3-10-12	10,230	7,435	.07	.05	8-8-4	4,822	2,642	.03	.02
3-12-6	662,644	728,934	4.47	5.34	8-8-6	6,152	968	.04	.01
3-12-12	2,281,712	1,841,928	15.41	13.50	8-8-8	10,128	6,753	.07	.05
3-18-9	107,907	119,013	.72	.87	8-8-4	21,323	21,371	.14	.16
3-18-12	3,274	0	.03	.00	8-8-8	286,142	146,855	1.93	1.08
4-4-6	3,298	186	.02	<.01	8-9-10	3,893	3,349	.03	.02
4-4-8	2,982	3,278	.02	.02	8-10-12	11,516	13,086	.08	.10
4-6-7	2,765	2,792	.02	.02	8-12-12	12,371	8,263	.08	.06
4-6-5	7,716	9,716	.05	.03	8-12-16	28,626	20,534	.19	.15
4-6-6	12,356	15,934	.08	.12	8-16-8	4,747	4,622	.03	.04
4-6-8	71,642	85,714	.48	.63	8-16-16	43,975	38,573	.29	.28
4-7-5	112,312	118,955	.61	.87	8-24-8	63,512	37,959	.43	.28
4-8-4	16,439	14,021	.11	.10	8-32-0	33,111	26,999	.22	.20
4-8-6	531,564	536,507	3.59	4.23	9-7-4	8,213	7,514	.06	.06
4-8-8	265,273	264,406	1.79	1.94	9-9-9	4,889	410	.03	<.01
4-9-10	39,421	5,227	.27	.04	10-4-10	38,153	30,094	.25	.22
4-8-12	91,550	83,350	.62	.61	10-4-12	3,242	2,243	.02	.02
4-9-3	81,950	83,010	.56	.61	10-4-20	2,597	3	.02	<.01
4-10-6	622,394	619,461	4.20	4.53	10-6-10	4,636	2,366	.03	.02
4-10-7	508,254	465,310	3.43	3.41	10-6-4	30,755	28,240	.21	.21
4-10-8	5,177	7,990	.03	.06	10-8-6	7,481	2,423	.05	.02
4-12-12	7,464	8,309	.05	.06	10-10-0	18,908	24,028	.13	.18
4-12-4	247,553	364,131	1.67	2.67	10-10-5	38,721	42,531	.26	.31
4-12-6	8,738	12,309	.06	.09	10-10-10	139,392	71,596	.94	.53
4-12-8	215,722	243,398	1.46	1.78	10-12-10	3,451	2,993	.02	.02
4-12-12	62,552	33,067	.56	.24	10-15-15	4,913	3,014	.03	.02
4-12-16	3,589	2,709	.03	.02	10-15-8	10,500	12,351	.07	.09
4-15-0	42,397	51,186	.29	.38	10-20-0	64,576	60,377	.57	.44
4-16-8	62,340	46,928	.42	.34	10-20-10	12,758	11,309	.09	.09
4-16-16	215,224	121,899	1.45	.89	10-30-10	11,366	9,171	.08	.07
4-24-12	86,290	65,092	.58	.48	12-0-10	9,078	14,524	.06	.11
5-3-6	3,359	3,014	.02	.02	12-0-12	6,941	3,569	.05	.03
5-6-6	10,385	8,794	.07	.06	12-4-8	2,799	10	.02	<.01
5-8-6	2,583	892	.02	.01	12-12-12	32,976	15,527	.22	.11
5-8-8	7,490	2,320	.05	.02	12-24-0	8,355	5,359	.06	.04
5-5-10	5,181	5,284	.03	.04	12-24-12	24,832	11,326	.17	.09
5-7-5	18,977	20,166	.13	.15	14-0-14	25,501	19,400	.17	.14
5-7-6	3,941	5,792	.03	.04	14-6-0	2,590	5,632	.02	.03
5-7-10	7,355	6,150	.05	.05	15-8-4	11,329	11,706	.08	.09
5-8-5	3,054	512	.02	<.01	15-15-0	7,124	0	.05	.00
5-8-7	23,291	26,531	.16	.19	16-0-6	4,415	3,747	.03	.03
5-8-8	3,342	142	.03	<.01	16-8-8	3,412	767	.02	.01
5-10-5	906,353	897,573	6.13	6.58	17-7-0	27,487	31,700	.19	.23
5-10-10	863,820	585,339	5.83	4.29	154 mixtures	14,459,229	13,230,382	97.71	96.99
5-10-15	10,338	3,962	.07	.03	Other specified grades1/	250,361	323,842	1.69	2.37
5-10-16	10,559	5,524	.07	.04	Grade not shown2/	88,314	86,714	0.60	0.64
5-10-20	3,448	1,536	.02	.01	Total 3/	14,808,504	13,640,938	100.00	100.00
5-15-10	8,442	5,956	.06	.04					
5-15-15	11,420	8,150	.08	.06					
5-15-30	3,257	3,559	.02	.03					
5-20-0	5,004	3,463	.03	.03					

1/ There were 994 in 1951-52 and 833 in 1950-51.

2/ There were, at least, 200 to 300 grades not shown by their guaranteed analysis.

3/ Does not include 277,845 tons consumed in the Territories.

Table 4 shows the principal materials consumed in the agriculture of each state. In Table 5 the various kinds of fertilizers so consumed are shown for each region. Quantities of materials used in the manufacture of mixtures are not included.

Materials

A slight change was made in these tables from those of former years. Quantities of secondary and minor element materials were taken out of the totals (Table 4) and are shown separately for each of the states. In Table 5, though shown separately, they are included in the grand totals for each of the regions. This has been done to show more clearly the trends in consumption of materials that contain only the primary plant nutrients.

The classes of materials consumed were, in order of their proportions, phosphates 3,314,156 tons (45.1 per cent), chemical nitrogen materials 2,582,924 tons (35.1 per cent), secondary and minor element materials 785,050 tons (10.7 per cent), natural organics 343,815 tons (4.7 per cent) and potassium materials 320,124 tons (4.4 per cent).

Major Changes

Principal net changes in consumption from 1950–51 in chemical nitrogen materials were the increases in anhydrous ammonia (42.1 per cent), ammonium nitrate–limestone mixtures (33.8 per cent) and ammonium nitrate (25.2 per cent) while calcium cyanamide decreased 34.2 per cent. Consumption of normal and concentrated superphosphates was 20.2 and 6.1 per cent less than in 1950–51, respectively. Consumption of the other phosphate materials was lower than in 1950–51 in about one-half of the states while their use was greater in the remaining states. A net increase in consumption approximating five per cent resulted.

Consumption of the principal potassium materials, potassium chloride, 50 and 60 per cent grades and potassium sulfate, was 10.8, 56.6 and 9.2 per cent greater than in 1950–51, respectively. In comparison with changes in other regions, the rate of increase for chemical nitrogen materials was

highest in the East North Central region; for natural organics and phosphates, in the Mountain region and for potassium materials in the West North Central region.

Regional Decreases

Decreases in consumption occurred in some regions. Biggest decrease in chemical nitrogen materials was in the territories; for natural organics, in the South Atlantic region and for phosphate and potassium materials, in the New England region.

The weighted average content of primary nutrients in materials is given, for the first time, by states, in Table 7. These averages are based on the composition and amount consumed, in the state, of the individual materials coming within the class.

Average Quality

The data show the average quality of the materials composing the class that are used for direct application in the agriculture of each state. The national average, in per

Table 4. - Principal Fertilizer Materials Consumed as Such, Year Ended June 30, 1952[1]

Tons

State & Region	Chemical Nitrogen Materials					Natural Organics		Phosphates				Potash Materials		Total Primary Nutrient Materials	Secondary and Minor Element Materials[2]
	Ammonium Nitrate	Ammonium Sulfate	Calcium Cyanamide	Sodium Nitrate	Other[2]	Dried Manures	Other[2]	Phosphate Rock[3]	Superphosphates 16-20 Percent Grades	Superphosphates 30-50 Percent Grades	Other[2]	Chlorides 50 & 60 Percent Grades	Other[2]		
Maine	1,314	142	106	286	93	655	172	10	8,071	0	126	26	1	11,002	71
New Hampshire	538	3	2	106	42	128	323	20	4,521	0	29	68	13	5,793	81
Vermont	315	7	6	65	89	72	48	190	16,241	0	40	366	26	17,465	35
Massachusetts	722	271	101	1,284	219	2,340	4,801	206	6,667	0	723	413	0	17,746	85
Rhode Island	79	188	19	120	53	211	706	10	801	1	103	89	3	2,383	11
Connecticut	542	170	76	889	119	1,071	14,409	119	6,900	7	1,230	1,312	951	27,796	891
New England	3,610	781	310	2,950	615	4,477	20,459	554	43,201	8	2,261	2,274	994	82,184	1,174
New York	8,237	808	850	6,798	1,145	4,047	6,436	986	116,104	89	1,519	600	94	147,713	592
New Jersey	2,888	201	1,629	3,265	266	3,345	2,066	371	7,640	1	808	1,354	20	23,854	117
Pennsylvania	2,979	2,374	962	2,354	529	3,696	4,759	3,166	71,877	42	1,396	1,624	331	96,067	972
Delaware	1,333	61	72	440	201	2,061	39	150	1,649	0	61	111	3	6,171	107
District of Columbia	0	0	8	57	0	238	269	0	86	0	150	2	0	810	0
Maryland	1,428	127	619	5,130	1,149	621	267	4,018	14,769	1	441	105	663	29,338	283
West Virginia	318	347	6	1,610	216	221	101	99	23,237	606	67	13	0	26,738	5
Middle Atlantic	17,180	3,918	4,146	19,634	3,506	14,228	13,937	8,789	235,362	739	4,432	3,809	1,111	330,691	2,076
Virginia	5,646	682	1,016	36,321	17,788	571	281	376	35,768	2,331	3,051	1,358	15,196	120,383	8,801
North Carolina	20,624	972	10,136	158,999	78,789	447	1,700	1,129	33,443	1,607	10,426	10,563	13,434	342,269	27,716
South Carolina	18,931	3,406	2,091	91,292	58,423	260	608	1,354	43,948	65	13,289	19,109	8,492	258,268	2,662
Georgia	18,041	2,919	1,516	96,556	35,722	1,025	656	998	33,712	81	26,630	13,056	2,878	233,790	14,114
Florida	6,977	1,586	737	15,355	11,601	882	5,798	18,742	12,726	68	5,261	4,748	10,585	95,964	20,522
South Atlantic	70,218	9,564	15,496	398,523	202,223	3,185	9,043	22,598	159,596	4,152	59,657	48,834	47,585	1,050,674	73,715
Ohio	9,518	8,438	930	2,299	4,433	1,150	7,272	9,427	17,081	3,779	709	736	248	66,020	86
Indiana	43,824	12,101	1,218	1,496	18,385	523	1,682	44,244	16,293	3,280	332	5,238	398	149,014	47
Illinois	26,207	17,418	255	796	19,613	3,006	6,572	646,576	46,513	5,552	4,536	63,316	1,736	842,094	47
Michigan	10,022	5,497	345	1,142	1,252	894	8,452	3,515	20,904	38	1,319	569	0	53,949	412
Wisconsin	9,563	350	41	11	119	589	3,571	18,289	2,836	27	4,441	2,654	204	42,695	210
East North Central	99,134	43,804	2,789	5,744	43,802	6,162	27,549	722,061	103,627	12,676	11,336	72,513	2,585	1,153,772	802
Minnesota	10,065	285	0	1	290	879	2,086	7,955	10,885	16,574	4,256	205	1	52,392	1,622
Iowa	32,011	4,929	110	0	6,398	67	1,307	25,399	53,906	7,325	15,313	2,646	67	149,078	4
Missouri	27,485	6,406	26	548	17,454	1,409	2,088	227,872	16,610	4,954	8,589	11,314	494	325,249	16
North Dakota	353	15	0	2	1	0	15	44	610	6,778	1,855	0	0	9,673	0
South Dakota	1,017	181	0	0	125	23	95	435	2,312	775	690	6	2	5,661	0
Nebraska	23,261	7,849	160	0	7,583	166	879	2,077	4,869	10,491	5,157	4	0	62,596	0
Kansas	25,064	11,070	0	20	2,095	78	380	20,456	16,409	24,998	22,098	250	7	123,104	0
West North Central	119,246	30,635	296	571	34,036	2,622	6,850	284,337	105,301	70,795	58,058	14,425	571	727,743	1,642
Kentucky	30,496	2,593	3,232	2,335	1,769	30	379	23,789	49,046	10,513	9,461	5,062	8,464	147,149	18
Tennessee	48,099	734	1,125	19,136	6,591	497	662	2,574	31,388	9,177	23,592	13,062	2,610	159,337	196
Alabama	61,426	5,910	332	99,781	15,362	449	150	2,719	58,106	2,621	208,035	14,535	2,328	471,349	485
Mississippi	115,621	27,084	4,395	62,334	39,738	18	0	7,488	61,940	4,568	100,261	31,164	83	454,594	1
East South Central	255,832	36,221	9,084	183,586	63,550	994	1,191	36,570	200,380	26,979	341,449	63,813	13,380	1,233,029	700
Arkansas	41,266	8,389	1,470	33,604	10,560	32	32	2,380	44,966	8,539	3,010	15,318	1,006	170,672	1
Louisiana	24,403	6,963	460	31,002	25,962	156	210	4,216	22,573	1,833	24,391	8,072	6	150,247	6
Oklahoma	8,236	2,546	0	357	98	198	363	41,885	40,661	4,106	5,510	3,414	73	107,637	0
Texas	24,536	25,526	1,865	2,944	20,406	2,959	1,133	30,011	127,445	18,086	57,466	1,536	48	313,961	7,922
West South Central	98,541	43,524	3,795	67,907	57,126	3,245	1,738	78,492	235,635	32,564	90,477	28,340	1,133	742,517	7,929
Montana	3,150	3,471	0	0	80	0	115	0	50	11,787	841	8	0	19,502	482
Idaho	6,218	13,038	40	0	99	0	30	590	18,871	13,131	5,199	57	0	57,273	4,342
Wyoming	202	360	0	0	26	0	0	51	1,594	3,777	0	0	0	6,010	75
Colorado	3,635	2,199	0	3	3,225	0	604	0	5,148	9,914	1,743	120	9	26,600	348
New Mexico	1,474	847	0	0	867	20	438	48	2,297	6,325	5,241	3	0	17,560	0
Arizona	11,335	17,254	801	1,718	23,305	2,499	199	0	6,143	3,482	17,578	13	540	84,867	7,297
Utah	3,720	12,180	0	0	18	47	120	65	5,480	4,316	1,421	252	5	27,624	430
Nevada	49	98	0	0	1	0	24	180	711	568	671	0	0	2,302	2,769
Mountain	29,783	49,447	841	1,721	27,621	2,566	1,530	934	40,294	53,300	32,694	453	554	241,738	15,723
Washington	10,765	10,324	120	350	10,848	1,243	3,277	1,848	10,728	4,614	6,157	1,643	22	61,939	2,987
Oregon	17,845	22,781	433	95	6,130	0	901	1,100	18,450	2,659	14,868	1,291	124	86,677	13,333
California	77,004	159,684	4,845	800	116,129	160,000[4]	58,534	1,073	70,139	15,575	78,936	1,332	3,732	747,783	664,965
Pacific	105,614	192,789	5,398	1,245	133,107	161,243	62,712	4,021	99,317	22,848	99,961	4,266	3,878	896,399	681,285
Continental U. S.	799,058	410,683	42,155	681,581	566,586	198,722	145,009	1,158,346	1,222,713	224,061	700,315	238,727	71,791	6,458,747	784,946
Hawaii	0	36,061	0	163	6,037	4	80	1,674	1,454	788	4,339	7,739	1,703	60,042	104
Puerto Rico	0	40,062	99	14	1,279	0	0	0	123	14	89	50	54	41,784	0
Alaska	131	11	0	3	1	0	0	0	0	196	44	60	0	446	0
Territories	131	76,134	99	180	7,317	4	80	1,674	1,577	998	4,472	7,849	1,757	102,272	104
Total: 1951-52	799,189	486,817	42,254	681,761	572,903	198,726	145,089	1,160,020	1,224,290	225,059	704,787	246,576	73,548	6,561,019	785,050
1950-51[5]	638,376	461,601	64,222	683,967	456,811	183,450	135,429	1,039,864	1,633,877	239,725	677,701	189,838	61,882	6,366,743	646,269
1949-50	577,562	234,664	81,878	627,424	264,676	165,219	127,964	749,263	1,856,777	265,185	487,026	109,289	69,610	5,606,197	439,507

1/ Includes materials distributed by Government agencies. Excludes lime and materials used by manufacturers in the formulation of commercial mixtures.

2/ The principal commodities are shown in Table 5, by regions.

3/ Includes colloidal phosphate, the quantity of which is shown separately, by regions, in Table 5.

4/ Estimated.

5/ Revised: 1950-51 data for Nevada should read:

	200	114	0	167	0	0	15	280	49	817	256	0	0	1,897	1,099

Table 5. - Kinds of Fertilizers Consumed in Regions of the United States, in Tons, During Year Ended June 30, 1952[1]

Kinds	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	Territories	Total
MIXED GRADES											
N-P-K	336,132	1,879,938	4,638,256	3,078,696	761,614	1,910,120	636,873	25,997	229,316	267,828	13,464,869
N-P	288	155	1,033	835	184,787	647	16,395	39,115	30,785	1,565	275,585
P-K	65,976	131,624	261,787	316,640	74,101	254,974	73,355	83	1,289	1,170	1,200,999
N-K	0	2	134,919	1,069	10	1,746	27	38	3	7,282	145,096
CHEMICAL NITROGEN MATERIALS											
Ammonia - anhydrous	0	2/	2/	2/	2/	2/	2/	2/	2/	2/	168,273
Ammonia - aqua	0	0	183	53	110	0	1,234	19	18,427	0	20,026
Ammonium nitrate	3,510	17,180	70,218	99,134	119,246	255,832	98,541	29,783	105,614	131	799,189
Ammonium nitrate-limestone mixtures	295	1,478	184,307	28,013	15,618	21,890	5,697	0	215	0	257,517
Ammonium sulfate	761	3,918	9,564	43,804	30,635	36,221	43,524	49,447	192,789	76,134	486,817
Calcium cyanamide	310	4,146	15,496	2,789	296	9,084	3,795	841	5,398	99	42,254
Calcium nitrate	0	0	7,066	872	87	4,909	1,305	4,027	31,109	83	49,456
Sodium nitrate	2,750	19,534	398,523	5,744	571	183,586	67,907	1,721	1,245	180	681,761
Other chemical nitrogen materials[3]	320	2,028	10,659	14,864	18,221	38,751	48,890	23,575	83,352	7,234	77,631[4]
NATURAL ORGANICS											
Blood, dried	0	266	48	89	0	0	0	7	1,214	0	1,644
Castor pomace	2,761	51	2,171	0	0	0	7	0	996	0	5,986
Compost and muck	0	0	416	0	0	0	0	0	0	0	416
Cottonseed meal	10,823	31	1,137	0	0	2	0	0	22	0	12,015
Fish emulsion	0	0	0	0	0	0	0	0	842	0	842
Fish scrap and meal	712	18	17	0	0	0	0	0	433	0	1,178
Hoof and horn meal	200	0	0	0	0	0	0	0	0	0	200
Manures, dried	4,477	14,228	3,185	6,162	2,622	994	3,245	2,566	161,243	4	196,726
Sewage sludge, activated	4,343	9,235	3,623	27,295	6,850	1,189	1,731	1,499	14,674	80	70,519
Sewage sludge, other	0	0	0	0	0	0	0	24	37,567	0	37,591
Tankage, animal	0	760	0	0	0	0	0	0	409	0	1,169
Tankage, garbage	0	1	0	73	0	0	0	0	1,100	0	1,174
Tankage, process	1,103	3,227	1,555	92	0	0	0	0	0	0	5,977
Other[5]	517	330	76	0	0	0	0	0	5,455	0	6,378
PHOSPHORUS MATERIALS											
Ammonium phosphate, 11-48	0	0	0	205	2,686	3	198	1,203	6,819	3,391	14,705
Ammonium phosphate, 16-20	0	0	4	2,713	33,157	70	64,436	24,106	72,551	1,081	195,118
Ammonium phosphate, 13-39	0	0	0	40	14,180	0	4,083	2,731	0	0	21,034
Ammoniated superphosphate	0	0	491	0	0	0	2,557	0	4,210	0	7,258
Basic lime phosphate	0	145	195	0	0	1,374	0	0	0	0	1,714
Basic slag	0	70	52,736	19	0	320,314	18,635	0	0	0	391,774
Bonemeal, raw	566	2,176	1,085	336	72	104	230	0	2,317	0	6,866
Bonemeal, steamed	1,394	2,041	261	789	6	203	0	0	62	0	4,756
Calcium metaphosphate	0	0	3,086	6,644	6,107	8,421	297	0	189	0	24,774
Fused tricalcium phosphate	0	0	1,759	590	1,650	10,930	0	0	0	0	14,969
Phosphoric acid: 20-53% P_2O_5	0	0	0	0	0	0	41	4,654	13,813	0	18,508
Phosphate rock	474	6,224	21,212	711,359	271,649	24,049	77,481	714	4,021	1,674	1,118,857
Colloidal phosphate	80	2,565	1,386	10,692	12,688	12,521	1,011	220	0	0	41,163
Precipitated bone	291	0	0	0	0	0	0	0	0	0	291
Superphosphate, 18%	1,942	31,736	76,466	27,921	12,270	52,010	880	4,332	75,387	0	282,944
" 19%	169	1	3,770	82	4,051	1,311	16,051	32,895	23,926	0	82,258
" 20%	41,090	203,625	79,360	75,624	86,980	147,059	218,764	3,067	2	1,577	859,088
" 30%	0	0	0	0	797	0	3,655	184	0	787	5,423
" 38%	0	0	0	36	17	0	5	0	0	0	58
" 42%	0	0	0	0	21,720	0	0	40,173	5,294	0	67,187
" 43%	0	0	0	0	0	0	0	0	46	0	46
" 45%	1	608	1	5,899	14,666	2,836	23,466	8,298	16,558	211	72,544
" 46%	0	101	0	3,888	21,167	3,088	1,508	3,201	629	0	33,582
" 47%	7	30	145	1,948	4,736	7,297	752	1,004	321	0	16,240
" 48%	0	0	2,399	848	7,293	12,969	1,328	40	0	0	24,877
" 49%	0	0	1,607	57	62	729	1,673	400	0	0	4,528
" 50%	0	0	0	0	337	60	177	0	0	0	574
POTASSIUM MATERIALS											
Cement flue dust	0	587	[illegible]	0	0	500	0	0	0	0	24,725
Cotton hull ash	695	1	0	3	0	0	0	0	0	0	699
Manure salts: 22-30% K_2O	0	115	3,583	1,306	2	125	480	0	0	0	5,531
Potassium carbonate	0	0	148	0	0	0	0	0	0	0	148
" chloride: 50% K_2O	90	665	36,466	29,458	762	35,861	17,415	13	1,825	0	122,545
" " 60% K_2O	2,194	3,144	12,368	83,055	13,663	27,962	10,925	440	2,441	7,849	124,031
" magnesium sulfate	79	126	2,056	814	342	1,096	611	0	0	749	5,873
" nitrate	0	0	5,919	0	0	0	0	0	0	0	5,919
" phosphate ash	0	0	1,363	0	0	725	0	0	0	0	2,088
" sodium nitrate	16	29	213	0	227	1,546	0	540	0	0	2,571
" sulfate	204	122	5,538	460	0	9,348	61	14	3,379	1,008	20,433
Tobacco stems	0	121	1,808	2	0	0	0	0	0	0	1,931
Wood ashes	0	10	3,519	0	0	0	1	0	0	0	3,529
Total primary nutrient fertilizers	484,580	2,042,410	6,136,568	4,551,012	1,748,155	3,400,516	1,469,167	306,971	1,167,772	380,117	21,547,368
SECONDARY & MINOR ELEMENT MATERIALS[6]											
Aluminum sulfate	4	58	1	6	0	0	0	0	0	0	69
Borax	54	174	227	331	0	250	7	18	302	0	1,363
Calcium sulfate	1,016	1,577	53,113	40	1,502	440	0	15,046	663,966	0	736,700
Copper sulfate	11	85	5,115	107	0	0	0	0	20	0	5,338
Ferrous sulfate	0	0	0	0	0	0	0	14	0	0	14
Magnesium carbonate	0	0	0	0	0	0	0	0	1,070	0	1,070
Magnesium sulfate	85	21	0	29	0	0	0	0	4	5	144
Manganese sulfate	2	58	8,167	268	24	0	0	0	326	0	8,845
Sulfur: 25-99+%	2	65	4,255	11	0	0	1,465	636	5,505	0	11,939
Sulfuric acid: 40-93%	0	0	0	0	0	0	0	0	6,909	0	6,909
Zinc sulfate	0	11	1,911	5	0	10	0	2	30	99	2,068
Minerals not classified	0	27	926	5	16	0	6,457	7	3,153	0	10,591
Total Sec. & Minor Elem. Mat.	1,174	2,076	73,715	802	1,542	700	7,929	15,723	681,285	104	785,050
TOTAL ALL FERTILIZERS	485,754	2,044,486	6,180,383	4,551,914	1,749,697	3,401,216	1,477,096	322,694	1,839,057	380,221	22,432,418

1/ Includes distribution by Government agencies. Does not include materials for manufacture of commercial fertilizers.

2/ Included with "Other Chemical Nitrogen Materials." Regional data cannot be published without disclosing operations of individual suppliers.

3/ Anhydrous ammonia, ammonium sulfate-nitrate, nitrogen solutions, urea, and unsegregated chemical nitrogen materials.

4/ Does not include above total for anhydrous ammonia.

5/ Miscellaneous seed meals: Linseed (162), Peanut (51), Soybean (362), Tung (15), and unsegregated organics (5788).

6/ Excludes materials distributed by other than manufacturers of fertilizers.

from arid wastes...

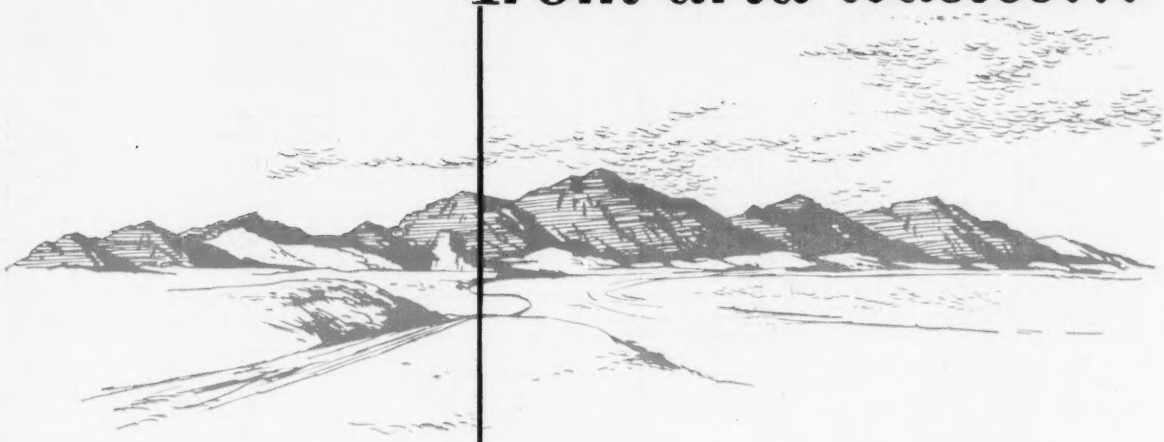

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Table 3. - Consumption of Mixed Fertilizers, By Grades, in Each State and Region, Year Ended June 30, 1952

State	Fifteen Principal Grades Consumed in Regions, Tons														All Other Grades		Total Tons
															Number[1]	Tons	
New England																	
	5-10-10	6-9-12	0-14-14	8-12-16	5-8-7	6-3-6	0-10-20	8-16-16	8-12-12	7-7-7	5-10-5	6-9-9	0-20-20	5-7-10	10-15-15			
Maine	27,706	69,103	14,470	27,844	4,327	0	893	5,473	9,954	302	438	9,776	215	7,293	4,813	42	18,851	201,458
New Hampshire	3,617	0	2,077	228	1,418	0	1,880	1,226	274	783	300	0	1,086	0	0	29	2,359	15,148
Vermont	7,191	0	11,821	459	496	0	4,990	3,777	115	752	554	0	4,232	0	0	32	4,263	38,649
Massachusetts	16,303	0	2,954	0	9,108	6,909	9,499	2,556	0	5,571	5,728	0	625	0	0	16	15,015	74,248
Rhode Island	6,039	0	976	8	882	0	393	174	329	1,016	853	0	122	0	0	27	3,553	14,345
Connecticut	8,797	0	847	87	6,478	14,946	3,208	1,119	1,096	2,829	2,860	0	2,299	0	0	54	13,982	58,548
Total	69,553	69,103	33,145	28,626	22,708	21,855	20,863	14,305	11,768	11,253	10,733	9,776	8,579	7,293	4,813	77	58,023	402,396
Middle Atlantic																		
	5-10-10	3-12-6	5-10-5	4-8-12	4-12-8	6-12-6	0-20-20	10-10-10	0-14-14	0-14-7	7-7-7	3-9-12	4-12-12	2-12-12	8-16-16			
New York	124,861	31,998	163,658	19,797	3,322	42,507	17,363	25,229	5,206	212	10,033	1,874	34	6	7,457	67	33,156	486,612
New Jersey	128,082	7,752	32,368	453	17,048	257	3,702	3,626	5,091	169	9,683	12,805	56	0	1,156	48	18,763	241,011
Pennsylvania	148,586	218,356	29,484	10,364	13,949	3,785	15,294	10,525	12,658	8,316	2,839	306	22,503	6,896	8,056	74	55,899	567,816
Delaware	29,620	10,340	4,018	4,928	3,794	0	1,002	1,262	2,923	333	113	2,106	128	4,303	1,078	30	8,261	74,109
District of Columbia	15	156	865	194	13	0	22	5	19	10	9	0	0	31	0	12	392	1,731
Maryland	40,785	99,049	23,721	23,403	11,548	0	1,326	2,536	6,519	5,418	2,177	6,203	173	10,737	466	45	32,744	267,305
West Virginia	13,293	16,855	3,575	6	4,328	0	6,633	528	6,244	11,009	3	0	38	769	71	23	9,783	73,135
Total	485,242	384,506	257,689	59,145	54,002	46,549	45,942	43,711	38,559	25,467	24,857	23,294	22,932	22,742	18,284	138	158,998	1,711,719
South Atlantic																		
	3-9-6	4-10-6	4-8-6	3-9-9	2-12-12	3-12-6	4-8-8	5-10-5	6-8-6	0-14-14	5-10-10	4-7-5	4-9-3	3-12-12	4-6-8			
Virginia	80,828	23,559	1	6,661	172,605	150,132	10	64,297	18,120	69,441	33,091	0	4,632	4	0	33	116,346	739,727
North Carolina	446,493	365,200	0	100,558	159,413	84,468	1,742	46,085	69,695	54,631	75,728	0	51,720	0	0	12	115,461	1,571,194
South Carolina	69,663	228,802	0	201,688	0	12,723	39,217	55,346	6,531	2,971	6,333	0	0	66,772	0	11	26,255	718,301
Georgia	36,222	2,173	480,949	93,337	40,034	1,697	109,212	7,835	46,638	1,981	8,859	7	4,838	10,270	45	108	209,090	1,053,207
Florida	20	771	50,346	3,863	2,106	16	70,356	5,959	11,513	1,040	3,011	119,305	20,760	1,832	71,510	719	611,157	973,565
Total	633,226	620,505	531,296	406,107	374,178	249,036	220,537	179,522	152,497	130,064	127,022	119,312	81,950	80,878	71,555	799	1,078,309	5,055,994
East North Central																		
	3-12-12	2-12-6	4-16-16	0-20-20	3-9-18	5-10-10	3-18-9	8-8-8	10-10-10	0-12-12	4-12-8	3-9-27	5-20-20	0-8-27	0-20-10			
Ohio	608,239	98,867	5,622	18,298	8,398	91,074	29,575	14,600	8,333	24,386	17,587	98	5,733	850	848	58	51,013	983,441
Indiana	600,456	28,030	59,010	27,646	34,098	15,601	13,256	36,434	15,386	19,033	9,591	19,047	6,247	6,629	686	57	44,022	934,174
Illinois	302,606	6,345	44,351	14,558	41,531	672	5,933	36,447	27,009	6,861	16,867	35,060	606	4,404	5,789	57	44,168	592,207
Michigan	273,494	47,264	31,019	21,566	14,903	3,311	48,628	6,170	4,487	14,820	10,702	994	7	5,125	2,002	27	52,068	536,560
Wisconsin	150,964	10	24,661	46,089	22,477	90	4,941	1,470	14,639	2,015	5,676	3,919	13,951	8,714	15,950	58	35,293	350,858
Total	1,935,759	180,536	164,663	128,159	121,407	110,746	102,333	93,121	69,854	67,115	60,422	59,118	26,544	25,722	25,275	127	226,564	3,397,240
West North Central																		
	3-12-12	4-12-4	4-24-12	10-20-0	8-24-8	8-8-8	4-16-16	4-16-0	4-16-8	0-20-20	8-32-0	2-12-0	4-12-8	6-24-0	3-9-18			
Minnesota	17,679	0	30,756	1,543	105	11	29,583	46	3,967	16,574	3,574	0	16	2,449	375	67	64,524	171,202
Iowa	68,377	2,195	433	16,409	451	2,695	16,645	33,392	32,713	2,606	7,806	4,047	23,699	18,966	3,110	83	44,302	277,846
Missouri	73,606	92,859	36,585	4,642	49,742	57,822	2,944	737	0	16,600	282	23,879	2,703	0	14,033	17	51,397	427,830
North Dakota	1,075	0	5,703	434	0	0	849	136	276	216	5,894	20	0	1,090	0	32	5,782	21,475
South Dakota	245	105	53	1,990	1	0	205	1,136	95	32	242	0	164	426	0	26	939	5,633
Nebraska	36	564	13	8,743	358	16	0	668	121	150	4,764	0	42	123	0	21	16,252	31,840
Kansas	1,903	10,631	984	29,897	11,201	1,160	5	2,029	79	375	10,305	3,647	0	292	105	29	11,973	84,586
Total	162,920	106,354	74,527	63,658	61,858	61,704	50,231	38,144	37,251	36,553	32,857	31,593	26,624	23,346	17,623	134	195,169	1,020,412

[1] Number of grades not shown.

	East South Central																	
	4-10-7	6-8-4	6-8-8	5-10-5	3-9-6	0-14-14	6-9-6	6-12-12	2-12-6	0-12-12	3-12-12	4-12-8	5-10-10	4-8-8	4-12-4			
Kentucky	0	51	3,158	1,183	51,850	5,392	92,470	4,677	75,347	37,750	46,308	46,046	20,794	173	5,521	47	92,232	482,952
Tennessee	163	7,798	9,991	6,523	114,831	655	4,590	87,413	11,439	36,282	11,178	4,976	19,144	41,233	28,525	47	58,486	443,327
Alabama	458,561	211,296	62,499	2,830	27	97,581	84	114	2	16	6	1	15	99	0	50	37,044	870,275
Mississippi	5	3,902	144,933	177,458	0	7,641	2,172	16	0	0	141	0	8,397	8	194	28	26,066	370,933
Total	458,729	223,047	220,581	188,094	156,706	111,369	99,316	96,220	86,788	74,048	57,533	51,023	48,350	41,513	34,240	96	213,928	2,167,487
	West South Central																	
	5-10-5	4-12-4	8-8-8	0-14-7	3-12-12	6-8-12	3-9-18	12-12-12	12-24-12	6-10-4	6-8-8	5-10-10	3-9-27	0-12-12	6-12-6			
Arkansas	64,945	9,419	4,074	1,801	4,712	35,299	33,043	6,573	1,794	1,708	58	1,893	10,453	1,186	62	37	11,048	188,068
Louisiana	41,764	20,983	34,028	3,127	29,631	1,749	283	9,045	3,110	3,124	13,892	3,097	0	1,543	400	24	14,307	180,083
Oklahoma	30,330	12,968	1,747	538	973	17	1,201	338	1,764	1,377	0	3,410	0	337	1,684	27	8,334	65,018
Texas	118,979	27,220	24,673	55,892	3,268	325	3	5,394	10,996	8,239	164	3,180	0	5,604	5,944	55	23,700	293,481
Total	256,018	70,590	64,522	61,358	38,584	37,390	34,530	21,350	17,564	14,448	14,114	11,580	10,453	8,670	8,090	92	57,389	726,550
	Mountain																	
	10-20-0	10-10-0	10-16-8	12-24-0	14-3-0	10-10-10	10-18-5	6-30-0	10-10-5	6-24-6	15-11-0	14-14-7	7-21-7	6-10-4	12-15-0			
Montana	2,017	0	30	0	0	0	125	392	0	0	0	0	0	342	0	14	373	3,279
Idaho	1,346	4,028	748	0	0	0	316	429	1,226	0	1,544	0	0	16	1,212	20	752	11,617
Wyoming	199	21	10	19	0	0	135	57	46	0	0	4	5	110	0	8	65	671
Colorado	1,221	208	3,995	3,336	0	1,647	1,585	834	331	1,588	0	0	1,366	0	10	38	4,462	20,583
New Mexico	859	222	0	0	0	0	0	0	1	0	0	0	0	38	0	14	400	1,520
Arizona	6,220	7,605	0	0	2,590	925	0	0	362	0	0	1,468	0	2	0	35	5,171	24,343
Utah	504	132	37	0	0	0	182	439	125	0	33	4	25	537	6	19	555	2,579
Nevada	96	0	1	0	0	0	0	0	27	0	0	0	0	302	0	12	215	641
Total	12,462	12,216	4,821	3,355	2,590	2,572	2,343	2,151	2,118	1,588	1,577	1,476	1,396	1,347	1,228	95	11,993	65,233
	Pacific																	
	10-10-5	17-7-0	8-8-4	6-10-4	8-10-12	15-8-4	5-10-10	6-9-6	10-16-8	4-10-10	10-10-10	10-12-10	6-20-20	10-10-0	10-20-20			
Washington	1,348	504	0	5,074	0	0	8,111	0	140	0	360	0	1,390	4	1,305	52	8,486	26,722
Oregon	220	0	0	1,336	0	87	2,225	0	5,639	0	190	0	1,792	313	397	60	8,099	20,298
California	31,964	26,110	19,723	10,343	11,386	10,741	0	9,009	0	4,404	3,575	3,424	0	2,156	0	300	81,518	214,353
Total	33,532	26,614	19,723	16,753	11,386	10,828	10,336	9,009	5,779	4,404	4,125	3,424	3,182	2,473	1,702	336	98,103	261,373
	Territories2/																	
	12-6-10	13-3-12	12-4-10	15-4-7	6-8-10	14-2-8	14-4-10	9-10-5	10-10-8	12-6-6	12-2-10	16-4-5	5-10-10	12-3-16	8-10-8			
Puerto Rico	52,389	28,230	27,310	24,722	21,916	9,903	9,312	7,488	7,238	6,190	5,561	4,332	2,796	2,556	2,505	29	9,746	222,193
	10-16-6	10-20-20	8-16-8	10-20-10	5-15-5	10-6-4	10-10-5	5-20-10	7-6-19	--	--	--	--	--	--			
Alaska	26	22	20	20	12	7	5	3	2	--	--	--	--	--	--	0	0	117

1/ The number of mixtures shown for each State and Region is exclusive of mixtures not specified by grade, although their tonnages are included in the totals.

2/ The total consumption in Hawaii was 55,535 tons of mixed goods which were manufactured to consumer's specifications.

cent, for materials that contain only nitrogen was 28.06, those containing only P_2O_5 14.71 (available P_2O_5); only K_2O, 49.98 and those having more than one nutrient 20.97.

Primary Plant Nutrients

Table 6 shows the consumption of primary plant nutrients, by states, while Figure 2 shows the total tonnage consumed in each region in comparison with consumption in 1950–51. These values are based on the amounts of fertilizers reported herein and their average analysis as found by the fertilizer control officials of the respective state in which these fertilizers were consumed.

National consumption of primary nutrients during the year ended June 30, 1952 was nitrogen 1,424,780; available P_2O, 2,199,-376; (total P_2O_5 2,678,070) and K_2O, 1,581,467 tons. These quantities represented net increases over 1950–51 in nitrogen of 187,803 tons, available P_2O_5 89,476 tons, (total P_2O_5 141,082 tons) and K_2O 201,654 tons. Consumption of primary nutrients was, therefore, 15.2, 4.2 (5.6) and 14.6 per cent greater than in 1950–51, respectively.

Amounts, Proportions

Amounts and proportions of the total quantity of nutrients consumed through mixed fertilizers were 648,223 tons or 45.5 per cent of the nitrogen, 1,680,705 tons (76.4 per cent) of the available P_2O_5, 1,806,523 tons (67.4 per cent) of the total P_2O_5 and 1,420,-395 tons (89.8 per cent) of the K_2O.

In 1951–52, the amounts consumed in mixed fertilizers were for nitrogen 11.0, available P_2O_5 9.0, total P_2O_5 9.0 and K_2O 13.2 per cent greater than in 1950–51. While the amounts of nutrients consumed in materials were 18.9 and 29.0 per cent greater for nitrogen and K_2O, respectively, they were 8.7 and 0.9 per cent less, for available P_2O_5 and total P_2O_5, respectively, than in 1950–51.

Comparative Figures

Total primary nutrients consumed in 1950–51 and in 1951–52 were 4,726,690 tons and 5,205,623 tons, respectively, a net increase of

478,933 tons or 10.1 per cent in comparison with the increase of 6.4 per cent for tonnage of fertilizers containing these nutrients.

LITERATURE CITED

[1]SCHOLL, W. and WALLACE, H. M., Consumption of Commercial Fertilizers in the U. S., 1950–51, Agr. Chemicals *7*, No. 6, 33–40 (1952); Com. Fertilizer *84*, No. 6, 20–21, 24–25, 28–29, 34, 36, 40–41 (1952); Farm Chemicals *115*, No. 7, 13, 15, 17, 19–21, 23–25, 27 (1952).

[2]MEHRING, A. L. and VINCENT G. P., Fertilizer Consumption in 1941 and Trends in Usage, USDA Cir. No. 689, October 1943.

[3]_____, WALLACE, H. M., and DRAIN, M., Consumption and Trends in the Use of Fertilizers in the Year Ended June 30, 1944, USDA Cir. No. 756, November 1946. ◆.

For a more detailed comparison of fertilizer consumption figures with those for the previous year, 1950–51, readers should consult the report printed in the July, 1952 FARM CHEMICALS, *page 13, containing similar tables and breakdowns.*

Table 6. – Consumption of Primary Plant Nutrients in Fertilizers, Year Ended June 30, 1952[1/]

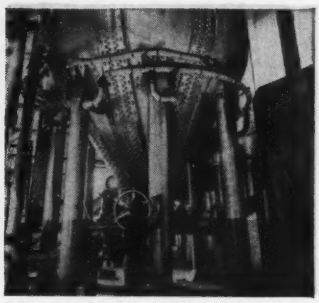
Tons

State & Region	In Mixtures					In All Fertilizers				
	Nitrogen	P_2O_5		K_2O	Avail. P_2O_5, & K_2O	Nitrogen	P_2O_5		K_2O	Avail. P_2O_5, & K_2O
		Available	Total				Available[2/]	Total[3/]		
Maine	12,205	21,681	22,566	25,917	59,803	12,804	23,342	24,263	25,954	62,100
New Hampshire	561	1,629	1,734	2,109	4,299	793	2,536	2,735	2,155	5,534
Vermont	1,035	5,188	5,376	5,803	12,026	1,136	8,679	9,030	6,035	15,900
Massachusetts	3,561	7,077	7,406	7,744	18,482	4,649	8,745	9,216	8,099	21,493
Rhode Island	716	1,443	1,528	1,452	3,611	876	1,647	1,743	1,506	4,029
Connecticut	3,138	5,064	5,781	5,554	13,796	4,575	7,239	8,080	6,926	18,740
New England	21,316	42,082	44,391	48,579	111,977	24,383	52,138	55,067	50,665	127,686
New York	25,184	55,085	57,543	41,607	121,976	30,360	79,299	82,960	42,129	151,777
New Jersey	11,834	25,908	27,094	23,224	60,966	14,123	27,511	29,035	24,115	65,360
Pennsylvania	22,614	69,562	72,256	51,699	143,875	25,299	85,096	89,222	52,318	163,213
Delaware	3,086	8,160	8,499	7,506	18,741	3,771	8,561	8,964	7,612	19,944
District of Columbia	89	179	182	114	382	125	243	249	124	492
Maryland	10,117	30,771	32,715	23,014	63,902	12,112	34,002	37,039	23,138	69,252
West Virginia	2,014	9,697	10,416	6,901	18,512	2,512	14,827	15,801	6,913	24,252
Middle Atlantic	74,937	199,252	208,705	154,065	428,254	88,302	249,629	263,270	156,349	494,780
Virginia	21,687	83,335	88,823	69,380	174,402	33,887	93,422	99,212	71,308	193,617
North Carolina	57,378	154,649	166,378	125,642	337,669	109,161	163,434	178,723	133,185	405,780
South Carolina	26,757	71,346	76,625	56,921	155,024	61,157	81,422	87,455	68,924	211,503
Georgia	42,556	93,206	101,177	81,064	216,826	74,510	102,356	111,627	88,793	266,159
Florida	48,023	69,989	84,862	72,421	190,433	57,233	74,033	94,500	77,701	208,967
South Atlantic	196,401	472,525	517,865	405,428	1,074,354	335,948	515,167	568,517	439,911	1,291,026
Ohio	31,459	121,544	130,348	113,639	266,542	39,131	127,369	139,164	114,098	280,598
Indiana	30,455	116,931	125,143	122,920	270,306	53,046	123,274	144,264	125,906	302,226
Illinois	22,360	71,896	77,062	80,882	175,138	43,671	104,526	297,089	118,134	266,331
Michigan	16,793	71,638	76,310	64,319	152,750	22,522	76,919	82,845	64,708	164,149
Wisconsin	9,954	50,336	53,470	55,311	115,601	13,535	54,331	62,688	56,808	124,674
East North Central	111,021	432,345	462,333	436,971	980,337	171,905	486,419	726,054	479,654	1,137,978
Minnesota	6,539	33,795	35,346	23,958	64,292	10,832	45,453	49,405	24,099	80,084
Iowa	12,916	44,833	47,004	22,564	80,313	28,808	64,185	74,081	24,111	117,102
Missouri	20,951	63,784	68,911	42,066	126,801	44,384	79,271	150,259	48,760	169,915
North Dakota	1,080	5,563	5,686	1,560	8,203	1,356	9,515	9,790	1,580	12,431
South Dakota	372	1,096	1,232	146	1,614	906	2,073	2,362	150	3,129
Nebraska	3,365	6,639	7,086	449	10,653	16,910	14,124	15,042	458	31,498
Kansas	6,600	17,029	18,014	2,790	26,415	21,636	38,660	46,020	2,946	63,232
West North Central	51,823	172,939	183,279	93,533	316,295	122,036	253,271	346,949	102,084	477,391
Kentucky	17,092	52,654	57,364	42,525	112,271	29,800	72,406	84,362	49,332	151,538
Tennessee	16,925	49,102	53,074	39,605	105,633	40,345	64,553	69,582	47,973	152,671
Alabama	36,005	87,236	94,104	66,252	189,493	78,753	120,521	131,703	75,064	274,338
Mississippi	20,674	35,625	38,373	25,462	81,661	101,361	60,656	67,191	41,838	203,855
East South Central	90,596	224,617	242,915	173,845	489,058	250,259	318,136	352,136	214,207	782,402
Arkansas	9,367	19,412	20,804	21,268	50,067	38,578	33,214	35,636	29,698	101,490
Louisiana	10,278	20,094	21,432	14,682	45,054	42,842	28,670	31,720	19,058	90,570
Oklahoma	3,431	7,965	8,406	3,767	15,163	7,712	20,960	33,818	5,757	34,329
Texas	14,272	35,666	37,688	19,449	69,407	50,789	82,974	94,842	20,439	154,202
West South Central	37,348	83,167	88,330	59,186	179,691	139,921	165,718	196,014	74,952	380,591
Montana	303	651	722	46	1,000	2,262	5,967	6,428	51	8,260
Idaho	1,306	1,567	1,715	165	3,037	6,937	12,517	13,204	200	19,654
Wyoming	63	120	128	19	202	226	2,162	2,744	19	2,409
Colorado	1,995	4,052	4,176	1,155	7,202	6,354	10,359	10,625	1,237	17,950
New Mexico	139	258	265	45	442	2,065	4,951	5,063	49	7,085
Arizona	2,754	3,437	3,618	442	6,633	25,030	11,604	11,915	572	37,206
Utah	229	450	473	80	759	4,250	3,769	3,951	235	8,254
Nevada	48	77	82	27	157	194	593	655	27	814
Mountain	6,836	10,612	11,181	1,979	19,427	47,340	51,922	54,086	2,390	101,652
Washington	1,823	3,270	3,610	2,726	7,819	15,815	9,215	10,318	3,764	28,794
Oregon	1,653	2,920	3,126	1,629	6,402	17,250	11,295	12,173	2,648	31,193
California	21,852	20,129	21,586	11,588	53,569	152,742	67,030	70,174	18,274	238,046
Pacific	25,328	26,319	28,322	16,143	67,790	185,807	87,540	92,665	24,686	298,033
Continental U. S.	615,606	1,663,848	1,787,321	1,369,729	3,669,183	1,366,401	2,179,940	2,655,799	1,545,398	5,091,739
Hawaii	5,715	4,744	5,120	9,096	19,555	16,930	7,170	8,074	14,405	36,505
Puerto Rico	26,892	12,094	14,063	21,558	60,544	41,384	12,144	14,113	21,616	75,144
Alaska	10	19	19	12	41	65	122	124	48	235
Territories	32,617	16,857	19,202	30,666	80,140	58,379	19,436	22,311	36,069	113,884
Total: 1951-52	648,223	1,680,705	1,806,523	1,420,395	3,749,323	1,424,780	2,199,376	2,678,070	1,581,467	5,206,623
1950-51[4/]	583,959	1,541,863	1,657,425	1,254,927	3,380,749	1,236,977	2,109,900	2,536,988	1,379,813	4,726,690
1949-50	495,360	1,344,296	1,446,118	1,018,174	2,857,829	1,065,452	1,949,768	2,290,081	1,103,062	4,058,282

1/ Includes Government distribution.
2/ Includes, as available P_2O_5, 2 percent of the colloidal phosphate and 3 percent of the phosphate rock marketed for direct application.
3/ Includes, as total P_2O_5, 22 percent of the colloidal phosphate and 32 percent of the phosphate rock marketed for direct application.
4/ Revised.

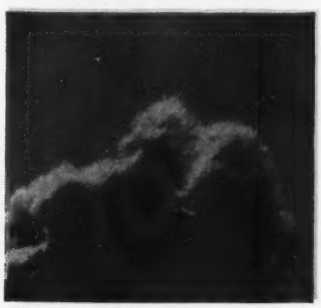
A trip through the barking drums is the first step for this southern pine, on its way to becoming pulp at Hudson's giant Florida Multiwall Sack mill. Logs are tumbled until stripped of all bark.

Wood is next reduced to chips like these. Whirling knives devour a 5-foot log in 10 seconds. The mill consumes 700 cords of pine daily.



Digesters 5-story high cook the chips under pressure in a scalding chemical solution. This reduces the wood to pulp.

Here is why HUDSON can guarantee Multiwall Sacks against breaking on the packer



After the pulp is washed, beaten, and screened, it looks like this. Note long fibers that give added toughness to Hudson Multiwall kraft.

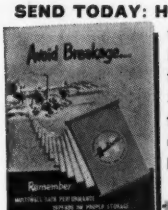
REASON NUMBER 2 **HUDSON MAKES ITS OWN PULP**

Wood pulp makes up 96 percent of the raw materials for your Multiwall Sacks. By growing its own wood, and manufacturing its own pulp, Hudson exerts iron-clad control of Multiwall Sack quality and delivery schedules. This is another reason why Hudson guarantees to replace *without cost* all Hudson Multiwall Sacks that fail on your packing or closing machines.

HUDSON

MULTIWALL SACKS

SEND TODAY: How to store your sacks for maximum performance



Profusely illustrated folder shows you the scientific way to store your sacks. Step by step procedures that improve the performance of your sacks by up-to-minute storage methods. No obligation.

MAIL THIS COUPON NOW to Hudson Pulp & Paper Corp., Dept. 235, 505 Park Ave., New York 22, for literature and full information.

NAME_____

COMPANY_____

STREET_____

CITY_____ ZONE____ STATE_____

HUDSON PULP & PAPER CORP., Dept. 235, 505 Park Avenue, New York 22, N.Y.

Table 7. - Weighted Average Content of Primary Plant Nutrients in Fertilizers, in Percent, Year Ended June 30, 1952[1]

State & Region	Mixtures[2]				Materials					Total Nutrients in Mixtures and Materials
					Single Nutrient[3]					
	N	Available P_2O_5	K_2O	Total Nutrients	N	Available P_2O_5[5]	K_2O	Multiple Nutrients[4]	Total Nutrients	
Maine	6.06	10.76	12.86	29.68	29.25	19.93	58.86	10.73	20.38	29.23
New Hampshire	3.70	10.75	13.92	28.37	29.89	20.72	51.16	9.26	21.32	26.43
Vermont	2.68	13.42	15.02	31.12	30.19	20.59	58.34	12.84	21.61	28.16
Massachusetts	4.93	9.53	10.43	24.89	21.34	19.52	60.20	10.01	16.91	23.35
Rhode Island	4.99	10.06	10.12	25.17	16.70	19.87	51.74	11.41	17.64	24.09
Connecticut	5.36	8.65	9.49	23.50	20.62	20.92	52.27	11.36	17.93	21.70
New England	5.30	10.46	12.07	27.33	23.56	20.37	54.02	10.32	19.11	26.35
New York	5.18	11.32	8.55	25.05	24.31	20.20	57.96	10.13	20.24	23.33
New Jersey	4.91	10.71	9.64	25.26	23.18	18.35	56.50	10.55	20.89	24.86
Pennsylvania	3.98	12.25	9.10	25.33	23.53	20.02	54.16	10.82	20.13	24.58
Delaware	4.16	11.00	10.13	25.29	28.97	18.59	61.23	8.38	19.49	24.84
District of Columbia	5.14	10.34	6.59	22.07	16.25	20.75	62.60	12.24	13.58	19.36
Maryland	3.78	11.51	8.61	23.90	22.73	16.53	14.82	14.67	18.24	23.34
West Virginia	2.75	13.26	9.44	25.45	20.25	21.33	53.33	10.26	21.09	24.28
Middle Atlantic	4.38	11.64	9.00	25.02	23.69	19.92	49.63	10.53	20.12	24.23
Virginia	2.93	11.27	9.38	23.58	19.77	23.57	11.31	26.36	20.11	23.09
North Carolina	3.65	9.84	8.00	21.49	19.15	18.72	31.33	11.10	19.90	21.21
South Carolina	3.72	9.93	7.92	21.57	19.65	17.14	48.92	34.72	21.87	21.66
Georgia	4.04	8.85	7.70	20.59	20.56	16.64	49.38	19.78	21.10	20.88
Florida	4.93	7.19	7.44	19.56	22.15	10.04	54.16	22.39	19.31	19.64
South Atlantic	3.88	9.35	8.02	21.25	19.80	17.04	37.36	22.44	20.62	21.14
Ohio	3.20	12.36	11.54	27.10	27.97	17.91	50.93	10.07	21.29	26.74
Indiana	3.26	12.52	13.16	28.94	29.18	9.80	52.59	8.69	21.42	27.90
Illinois	3.77	12.14	13.66	29.57	31.74	4.63	57.11	15.26	10.83	18.57
Michigan	3.13	13.35	11.99	28.47	28.53	19.30	58.18	9.81	21.13	27.30
Wisconsin	2.84	14.35	15.76	32.95	33.27	15.10	51.45	9.33	21.25	31.68
East North Central	3.27	12.73	12.86	28.86	30.01	6.18	56.48	11.59	13.66	25.00
Minnesota	3.82	19.74	13.99	37.55	33.16	29.91	56.34	24.71	30.15	35.82
Iowa	4.65	16.14	8.12	28.91	31.50	17.85	57.67	38.34	24.68	27.43
Missouri	4.90	14.91	9.83	29.64	38.49	6.63	56.88	25.99	13.26	22.56
North Dakota	6.03	25.90	7.26	38.19	32.74	[illegible]	--	42.65	43.71	39.91
South Dakota	6.60	19.46	2.59	28.65	31.54	23.59	48.50	32.57	26.76	27.70
Nebraska	10.57	21.48	1.41	33.46	32.66	33.00	60.80	38.16	33.30	33.35
Kansas	7.80	20.13	3.30	31.23	30.63	24.45	59.06	43.56	29.90	30.44
West North Central	5.08	16.95	9.17	31.20	33.62	14.13	57.06	37.26	21.86	27.31
Kentucky	3.54	10.90	8.80	23.24	31.39	21.26	50.35	10.93	26.69	24.05
Tennessee	3.82	11.08	8.93	23.83	30.81	22.92	55.09	17.56	29.65	25.36
Alabama	4.14	10.02	7.61	21.77	23.25	12.22	56.39	26.03	17.98	20.44
Mississippi	5.55	9.60	6.86	22.01	32.42	14.36	52.41	29.05	26.87	24.69
East South Central	4.18	10.36	8.02	22.56	29.06	15.40	53.38	21.06	23.81	23.02
Arkansas	4.98	10.32	11.32	26.62	30.14	23.51	51.51	37.71	30.13	28.29
Louisiana	5.71	11.16	8.15	25.02	35.92	15.74	54.12	29.10	30.29	27.42
Oklahoma	5.28	12.25	5.79	23.32	30.27	13.22	56.86	38.16	17.81	19.88
Texas	4.86	12.16	6.63	23.66	36.17	19.76	59.09	35.72	27.01	25.38
West South Central	5.14	11.44	8.15	24.73	33.72	18.26	53.26	35.43	27.06	25.61
Montana	9.24	19.85	1.41	30.50	27.07	43.35	60.60	34.34	37.33	36.35
Idaho	11.23	13.49	1.42	26.14	24.96	29.76	60.56	39.21	29.01	28.53
Wyoming	9.39	17.88	2.83	30.10	27.58	37.65	--	--	36.72	36.06
Colorado	9.69	19.69	5.61	34.99	46.47	37.97	61.57	26.42	40.41	38.04
New Mexico	9.15	16.97	2.96	29.08	34.28	39.59	60.50	37.16	37.23	37.13
Arizona	11.31	14.12	1.82	27.25	36.68	35.18	60.50	34.57	36.02	34.07
Utah	8.88	17.45	3.10	29.43	23.74	30.67	59.56	33.76	27.13	27.33
Nevada	7.49	12.01	4.21	23.71	24.98	26.03	--	35.22	28.76	27.66
Mountain	10.48	16.27	3.03	29.78	32.81	34.76	60.26	35.38	34.01	33.11
Washington	6.82	12.24	10.20	29.26	40.11	25.35	59.28	24.61	33.58	32.48
Oregon	8.14	14.39	9.01	31.54	28.06	22.10	57.69	36.85	28.60	29.16
California	10.19	9.39	5.41	24.99	32.12	28.01	52.00	13.50	24.67	24.74
Pacific	9.69	10.07	6.18	25.94	32.27	26.74	54.48	16.06	25.69	25.74
Continental U. S.	4.16	11.24	9.38	24.78	27.99	14.71	49.78	20.72	22.02	23.65
Hawaii	10.29	8.54	16.38	35.21	25.25	14.90	56.25	53.90	31.56	33.32
Puerto Rico	12.10	5.44	9.70	27.24	34.93	23.05	55.24	36.00	34.94	28.47
Alaska	8.55	16.24	10.25	35.04	32.25	47.74	60.56	36.36	43.80	41.74
Territories	11.74	6.07	11.04	28.85	30.04	16.68	56.26	53.38	32.99	29.86
U. S. Average:										
1951-52	4.30	11.14	9.42	24.86	28.06	14.71	49.98	20.57	22.20	24.06
1950-51	4.18	11.03	8.98	24.19	--	--	--	--	21.14	23.23
1949-50	4.02	10.93	8.29	23.24	--	--	--	--	21.41	22.67

1/ Excludes materials not guaranteed to contain N, P_2O_5, or K_2O.

2/ Guaranteed to contain two or more of the primary plant nutrients, N, P_2O_5, or K_2O.

3/ Guaranteed to contain one of the primary plant nutrients. Includes ammonium nitrate, superphosphate, potassium chloride, etc.

4/ Guaranteed to contain two or more of the primary plant nutrients. Includes potassium nitrate, ammoniated superphosphate, ammonium phosphates, some organic materials, etc.

5/ Includes the available P_2O_5 content of colloidal phosphate and phosphate rock as 2 percent and 3 percent, respectively.

FERTILIZER MATERIALS MARKET

New York

May 11, 1953

Sulfate of Ammonia

While most producers were hard put during the last 30 days to get material out on order, signs of easement were evident in several directions with the peak of the mixing and shipping season past. No price changes were noted and foreign imported material was still available at Southern ports.

Ammonium Nitrate

This is one material that is still scarce and hard to locate for nearby shipment and demand continues heavy from various sections.

Urea

Imports continue of this material with domestic producers sold out for current season. Imported material ranges from $130 to $135 per ton at the ports.

Nitrogenous Tankage

This material is moving slowly and is available for prompt shipment at prices from $4.40 to $5 per unit of ammonia ($5.35 to $6.08 per unit N), according to shipping point.

Castor Pomace

While production of this material remains small, demand also has eased and material is available for quick shipment at $37.25 per ton, f.o.b. production points.

Bone Meal

This material has eased in price recently and current prices are around $65 per ton, f.o.b. shipping points, for the fertilizer grades, with feeding bone meal quoted at around $60 per ton.

Fish Meal

With the approach of the new domestic menhaden fishing season, buyers were reluctant to buy ahead and only bought to fill current needs. Imported material was available in limited quantities at about $135 per ton, f.o.b. Atlantic ports and in some spots was rather scarce for quick shipment.

Organics

Prices of organic fertilizer materials showed a tendency to decline in price with the approach of the end of the mixing season and most buyers preferred to wait and see if prices would work lower before replacing their stocks. Tankage and blood were quoted at $4.50 to $5 ($5.47 to $6.08 per unit N), f.o.b. shipping points according to quality. Vegetable meals were easy pricewise as the government placed a considerable quantity of cottonseed meal on the market. Soybean meal was quoted at about $65 per ton, f.o.b. Decatur, Ill., in bulk for prompt shipment and linseed meal at $62 per ton in bulk, f.o.b. Minneapolis. Demand from the feed trade for various materials was limited.

Hoof Meal

Recent sales were made on the basis of $6.25 per unit of ammonia ($7.59 per unit N), f.o.b. Chicago and demand is limited. Buyers are only buying material as actually needed.

Superphosphate

No shortages were reported in this material and although there have been rumors of an increase in price for the new season because of the rise in the price of sulfur, so far no actual reports of price increases have been made. Triple superphosphate for quick shipment remains extremely hard to locate.

Potash

Producers claim shipments during April were made at a high rate but a noticeable slackening in shipping orders was noted during the past week. So far three domestic producers have issued new price lists for the new fertilizer season, with no change in price except the discounts in some cases are arranged slightly differently.

Philadelphia

May 12, 1953

While the general demand for raw materials is quite slow, blood and tankage are a trifle stronger, bone meal is weaker and demand for nitrogenous tankage is almost entirely lacking. Nitrate of ammonia still is exceedingly scarce. Nitrogen solution prices are scheduled for increase July 1, and anhydrous ammonia, which presently is in great demand, also is expected to be substantially advanced. Superphosphate and potash are enjoying satisfactory movement.

Sulfate of Ammonia.—While coke-oven grade is reported in good demand, and somewhat behind in deliveries, the synthetic grade is in somewhat better supply. Considerable imported is said to be in store at Southern ports.

Nitrate of Soda.—While domestic production is reported sold well ahead, the imported material has been moving steadily and is in ample supply to meet requirements.

Blood, Tankage, Bone.—Blood and tankage are in slightly better price position at about $4.75 per unit of ammonia ($5.77 per unit N) here in the East, and $5 ($6.08 per unit N), Chicago. Bone meal is easier, with asking price now at $65 per ton, and demand quite limited.

Fish Scrap.—While the market is quiet, there has been sufficient demand to keep the menhaden meal quotation at about $135 per ton. The new season should be on us shortly.

Phosphate Rock.—The demand is strong and market firm, with no surplus stocks.

Superphosphate.—The demand is strong with shipments moving steadily, and there are sugges-

FERTILIZER MATERIALS MARKET

tions of a price advance in the air.

Potash.—Recent shipments of domestic potash have been quite heavy. Most major producers are continuing present prices through the new season. It is noted with interest that importations during 1952 were very much less than in 1951.

Charleston

May 11, 1953

In the Southeast, mixing is practically at a standstill and demand now is for top-dressing and side-dressing materials. Most materials, in general, appear to be adequate except for spotty shortages of superphosphate in the Midwest.

Organics.—Considerable activity has been noted in Blue Lupine Meal which Commodity Credit Corporation, effective May 1, is now pricing at $21 per ton, in bags, and $19 per ton in bulk, f.o.b. Georgia or South Carolina origin points. Large quantities have been sold during the past week of this material which tests approximately 5 per cent nitrogen and is available for shipment May through December. Domestic nitrogenous tankage continues at prices from $4.50 to $5 per unit of ammonia ($5.47 to $6.08 per unit N) f.o.b. production points. Imported nitrogenous is indicated at around $5.35 to $5.50 per unit of ammonia ($6.50 to $6.68 per unit N), in bags, c.i.f. Atlantic ports.

Castor Pomace.—Current quotations remain at $37.25 per ton in burlap bags, less $2 per ton if shipment is made in paper bags, f.o.b. Northeastern production points.

Blood.—Domestic unground dried blood is indicated at $4.75 to $5 per unit of ammonia ($5.75 to $6.08 per unit N), bulk, f.o.b. Chicago area and also in the New York area.

Potash.—Several producers of domestic potash announced prices for the new season at 43 cents per unit of K_2O, bulk 60 per cent muriate, f.o.b. Carlsbad, with bagging charges of $4 to $4.25 per ton. Discount periods vary among the producers. No price schedule has been announced for imported material as yet but stocks on hand are available at several Atlantic ports at prices well under cost of domestic material.

Ground Cotton Bur Ash.—This excellent source of carbonate of potash, particularly adaptable for use in tobacco fertilizers, is available for prompt and future shipment at prices approximating the delivered cost of domestic sulfate of potash. Analysis currently is 38 per cent to 42 per cent K_2O.

Phosphate Rock.—Market continues firm, with low grade in ample supply but high grade somewhat tight.

Superphosphate.—Demand for normal superphosphate continues firm and in some midwestern areas, supply is temporarily short. Prices are firm and expected to rise after June 1 because of increased cost of sulfur. Demand for triple superphosphate exceeds supply.

Sulfate of Ammonia.—Domestic sulfate of ammonia continues in heavy demand, particularly in the Midwest. No prices for the new season have been announced. Imported material is available along the coast from stocks at ports at around $47 per ton, bulk.

Nitrate of Soda.—Demand continues in seasonal dimensions and stocks appear to be adequate.

Nitrogen Solutions.—A large producer announced that nitrogen solutions 2-A, 3 and 4 will advance in price to $128 per net ton of N, f.o.b. Hopewell, Va. or Southpoint, Ohio. Same price will apply for solution 6, f.o.b. Southpoint. These prices effective July 1.

Calcium Ammonium Nitrate.—Demand continues active and material periodically arrives at Atlantic and Gulf ports. Analysis is 20.5 per cent nitrogen and price is $51.25, bagged, f.o.b. cars at ports.

Industrial News

New Products **New Plants** **New Appointments**

Farm Chemicals Wins Another Safety Award

For the second consecutive year FARM CHEMICALS has been awarded the National Safety Council's Public Interest Award for "exceptional service to safety."

The award for 1952 was in recognition of numerous articles and news items concerning safety in the farm chemicals industry.

It will be presented formally to Sam Lewis Veitch, publisher of FARM CHEMICALS, at one of the June fertilizer conventions, according to Stewart A. Washburn, staff representative of the Fertilizer Section of the National Safety Council.

Ned H. Dearborn, president of NSC, in a letter of congratulations to this magazine, said "We here at the Council have been aware of all you have been doing for safety, and we are delighted that the judges agreed."

He added, "I am sure you feel, as we do, that there is another, less tangible result of your safety efforts . . . the knowledge that you have helped prevent many accidents."

MFA Building Plant

Construction of a $3½ million fertilizer plant near Joplin, Mo., is planned by Missouri Farmers Association. It awarded a contract for the plant to Merritt-Chapman & Scott Corp., of New York, for construction of the plant. It was designed by Dorr Co., of Stamford, Conn., and will produce 70,000 tons of mixed fertilizer a year.

Wilson Heads Board

Charles E. Wilson has been named chairman of the board of directors of Grace Chemical Co. He formerly was president of General Electric Co., first chairman of the Defense Mobilization Board and executive vice chairman of the War Production Board.

Thousands See Handling Equipment

This Allis-Chalmers crawler tractor was one of many exhibited at show.

THE rumble of mobile machinery, the purr of scores of motors and the hum of conveyors vied for the attention of nearly 25,000 visitors to the Fifth National Materials Handling Exposition in Convention Hall, Philadelphia, May 18–22.

The visitors, representing most of the country's important manufacturers, all were looking for ways of reducing the tremendous cost of handling materials in their plants.

According to industrial statistics this phase of manufacturing accounts for 25 per cent of the production payroll, largest expenditure for a single part of the production setup.

Exhibiting in the huge hall, especially altered to accommodate the record number, were 340 materials handling equipment manufacturers, many of them with lift trucks, bulk loaders, conveyors and other equipment of interest to the farm chemicals industry.

The exhibit covered approximately six acres and is the largest industrial show to be held anywhere in the country this year and the largest ever to be held in Philadelphia.

Among the interesting exhibits were a rubber swinging door to speed up movement of trucks (Stic-Klip Mfg. Co.), a new digging loader (American Tractor Corp.), a freight car designed especially for shipment of dry powdered materials (General Transportation Corp.), a special conveyor for loading and unloading trucks (A. B. Farquhar division of Oliver Corp.), pulsating panels to make bulk materials flow freely from bins and hoppers (Gerotor May Corp.), a training program for fork truck operators (Yale & Towne Mfg. Co.), a "radically new" fork lift truck which has "unprecedented fuel economy" (Baker-Raulang Co.) and scores of other devices and services of interest to this and many other industries.

The exhibit was founded by Clapp & Poliak, Inc.

Industrial News

Leaders Meet at CFA Convention

California Fertilizer Association officials talk with guests at conference. From left, Dr. W. E. Martin, extension soils specialist, University of California, Berkeley; S. B. Tatem, CFA president, Swift & Co.; Dr. John R. Taylor Jr., agronomist, American Plant Food Council; J. H. Nelson, conference chairman, Nelson Laboratories and Allen B. Lemmon, chief of the State Bureau of Chemistry at Sacramento, Cal. (See news item at right.)

CFA Plans Convention

With its highly successful fertilizer conference at Marysville, Cal. barely over, members of the California Fertilizer Association already are making plans for the second annual conference to be held in another part of the state next year.

More than 200 persons attended the first conference May 7 and 8 from California, Oregon, Washington, British Columbia, Idaho, Nevada, Arizona and Washington, D. C.

The fertilizer industry, the University of California and the Soil Conservation Service all were represented at the conference.

Doane Service Reports On 16 Soil Conditioners

Just how effectively 16 commercially available synthetic chemical soil conditioners stabilize soil aggregation is shown in a report made by Doane Agricultural Service.

The organization tested the conditioners in cooperation with the Agricultural Institute of St. Louis.

The study was started in May of last year after a conference at Battelle Memorial Institute, Columbus, O., to outline steps which should be taken for establishing such a study.

Site of the tests was a plot of land in the Florissant Valley near St. Louis. The soil was a silty clay loam showing a little more than 20 per cent clay size.

Four replications of each conditioner were included in the tests, with chemicals being applied according to manufacturers' specifications. Soil samples were taken before and after the test to measure the change in aggregation by the addition of the conditioners.

Results of the tests are summarized in a report available from Doane at 5144 Delmar Blvd., St. Louis, Mo.

Five Talks on Safety Heard At Meeting in Roanoke, Va.

Five interesting talks on safety in fertilizer plants were featured as part of the three-day Virginia Safety Conference May 7–9 in Roanoke.

More than 20 representatives of the industry attended sessions of the state-wide conference May 7 and 8, with sessions concerned directly with the industry held on the latter day.

Case Histories

Case histories of several types of accidents that could happen in any fertilizer plant were outlined by Curtis Cox, of Virginia-Carolina Chemical Corp. Cox discussed the cause of the accidents, the resultant loss of time and money and what his company has done to prevent such accidents.

W. C. Creel, of the North Carolina Department of Labor, listed four points for developing a safety program in a fertilizer plant. He said no safety program will be successful unless it 1. has management's backing, 2. has responsibilities properly delegated, 3. is well planned and 4. is set up to pinpoint problems and correct them.

A chalk talk on safety problems involved in the use of gangboards was presented by W. R. Conner, of Paul H. Werres Co., Washington, D. C., who showed that, regardless of the variances in level, proper gangboards can be arranged.

"What's New in Fertilizer," a talk by Dr. Edwin C. Kapusta, chemical engineer for the National Fertilizer Association, concentrated mainly on the use of pesticides in fertilizers.

Kapusta's Talk

Reference material for Kapusta's talk was taken from the 1953 official publication of the Association of Economic Poisons Control Officials.

Lawrence A. Long, editor of Agricultural Chemicals, summarized the value of publicity in safety.

Chairman of the fertilizer division meetings at the conference was William C. Richardson, assistant manager of the fertilizer department of Southern States Cooperative, Richmond.

Industrial News

Heads Atlas

Ralph K. Gottshall

New president of Atlas Powder Co. is Ralph K. Gottshall, who was named to the post at the recent annual meeting of the board of directors.

Gottshall was elected also to head the executive committee.

The new president succeeds Isaac Fogg, who became chairman of the board and remains as chairman of the finance committee.

Fogg's retirement was in line with the company's policy. He had served as president and chairman of the executive committee since 1945.

Fogg in turn succeeds Leland Lyon as chairman of the board. Lyon was named chairman of the board in 1945. He will remain as a member under the new organization.

Gottshall had served as executive vice president of Atlas since May of last year. He has been a director and a member of the executive committee since 1951.

S. B. Penick Dies

S. B. Penick, chairman of the board of S. B. Penick & Co., died May 24 at Mountainside Hospital, Montclair, N. J. He was 71.

Penick established the business in 1914 to make botanical drugs, fine chemicals, essential oils and related articles.

Industrial News

Kingsbury Opens Fertilizer Plant

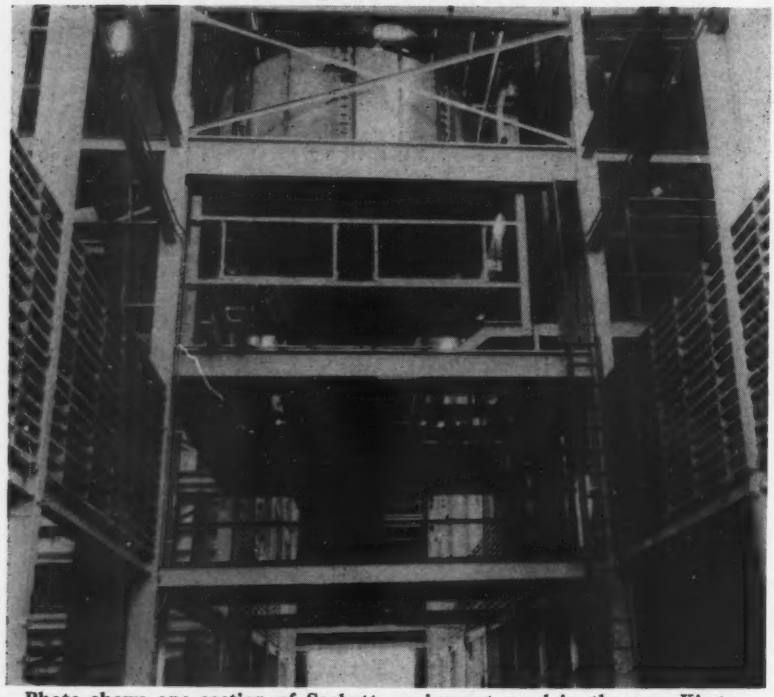


Photo shows one section of Sackett equipment used in the new Kingsbury & Co., fertilizer mixing plant recently opened in Minneapolis.

A modern fertilizer mixing plant has been opened by Kingsbury & Co. of Indianapolis, one of the oldest fertilizer manufacturers in the Midwest.

The new plant, located at Peru, Ind., was designed, constructed and equipped by the A. J. Sackett and Sons Co. of Baltimore, Md.

The plant was custom engineered by Sackett to meet exactly the production and shipping requirements of Kingsbury. It features modern receiving and bulk distributing, recording type manufacturing and continuous ammoniating and shipping facilities.

Ammonia Institute Names Criswell V. P.

New executive vice president of the Agricultural Ammonia Institute is Jack F. Criswell, a member of the National Cotton Council's production and marketing division staff since 1948. Criswell took office May 1, with offices in the Claridge Hotel, Memphis, Tenn.

Chemical Construction Has New Urea Synthesis Process

A new urea synthesis process has been developed by Chemical Construction Corp.

E. D. Powers, president of the company, said it is a complete recycle process permitting 76 per cent conversion of ammonium carbamate to urea per pass, nearly twice that of other processes now available commercially.

New Mathieson Institute

A Mathieson-Squibb institute of chemical research and engineering has been set up by Mathieson Chemical Corp., President Thomas S. Nichols announced late last month.

Heading the newly created institute will be Dr. Carl F. Prutton, vice president of Mathieson.

The institute will consolidate Mathieson's expanding chemical research and engineering activities.

NFA Economist Attacks High Rail Freight Rates

Continued high level rail charges on the movement of fertilizers and fertilizer materials will lead to a further diversion of the traffic to truck transportation.

That was declared by John F. Gale, economist for the National Fertilizer Association, in a warning to the nation's railroads.

Gale warned that the diversion of traffic would mean a further reduction in railroad income. The NFA official filed the statement with the Interstate Commerce Commission May 14, in opposition to a petition of the rail carriers asking that a 15 per cent increase in freight rates, which the commission granted last year on a temporary basis, be made permanent.

Despite the fact that more fertilizer is being consumed by farmers, Gale asserted, rail freight revenue from such shipments has been decreasing. He said this is "amazing" and attributed to the fact that the traffic is being diverted to other transportation agencies because of the high rates of the railroads.

Calcium Carbonate Used In Insecticide Dusts

By mixing organic insecticides with chemically-treated calcium carbonate entomologists of the USDA are developing improved insecticidal dusts, the Department reports.

The new mixtures have good dusting qualities, giving a free-flowing dust cloud and good coverage of plants in field tests with both airplane and ground equipment.

Mixtures of calcium carbonate with DDT, EPN, BHC, heptachlor, parathion and toxaphene still were effective after storage for a year or longer in tests conducted cooperatively by agricultural experiment stations in Texas and Mississippi and USDA's Bureau of Entomology and Plant Quarantine. This is especially significant because calcium carbonate has been considered by some to be incompatible with most organic insecticides because of its alkaline content.

Industrial News

New England Gets First Pesticide Plant

New England's first completely technical process plant for manufacturing pesticides was opened in Westbrook, Me., April 25.

The unit, constructed by Northeastern Chemical Corp., answers an urgent need for the pesticides in the area, according to Henry J. Hinman, president of the company.

Farmers in New England have suffered thousands of dollars in crop damage and loss when the supply of chemicals during unexpected blights has depended on sources hundreds of miles away, he declared.

Location of the plant should cut approximately 48 hours off running time between the supply source and the farmers and fruit growers in the area, he added.

The plant features modern machinery for grinding, mixing and blending insecticides, fungicides and herbicides. It will produce field strength DDT at a rate of 5,000 pounds an hour.

Manager of the plant is Joseph P. McKenna.

For Sale

Steel Tanks for Sale: Dished heads—all welded. Excellent for storing liquid fertilizer, chemicals, etc.
At Marion, Ind.—(12) 12,700 gal., (4) 11,000 gal., (6) 5,500 gal. At Norfolk, Va.—(13) 15,200 gal., (3) 5,800 gal. At Tonawanda, N. Y.—(5) 7,000 gal. At Mt. Carmel, Pa.—(9) 4,600 gal., (5) 4,300 gal. (2) 3,800 gal. Perry Equipment Corp., 1430 N. 6th Street, Phila. 22, Pa.

Commercial Names Two

Two vice presidents at Commercial Solvents Corp. have been elected to the board of directors of the corporation.

Election of Abbott K. Hamilton, vice president of the products division, and Sydney T. Ellis, administrative vice president was announced by J. Albert Woods, president of the organization.

Nitrogen Price Drops

The first drop in recent months of the price for solid forms of nitrogen is reflected in lowered prices for cyanamid.

American Cyanamid Co. announced that effective July 1 price of granular cyanamid in bags will be $55 a ton and $2.75 for pulverized grade in bags, per unit N. Prices are f.o.b. Niagara Falls, Ont.

Industrial News

Mente Bag Co. Closes After Recent Purchase

Mente & Co., one of the country's largest manufacturers of textile bags, went out of business last month with purchase of the company by three buyers.

The New Orleans company formerly was owned by Isaac T. Rhea, a Memphis capitalist. He died earlier this year.

Purchasing 96 per cent of the Mente stock at an unannounced price were Thomas J. Semmes, president of Semmes Bag Co., of Memphis; M. A. Greenberg, president of the Republic Bag Co., of St. Louis and H. J. Reichert of the American Bag Co., Minneapolis.

The stock was bought from Mrs. Louise Rhea Baxter, daughter and heir of Rhea.

The company was founded in 1885 by the late E. W. Mente and the late E. V. Benjamin.

6-1 New High Lift Shoveloader

Made for exceptionally high lifting, for loading gondola cars, hoppers and trucks with bulk materials, is a new high lift model of the Baker-Lull Shoveloader.

Baker-Lull Corp. says its new loader can lift to heights of 16 ft., and dump at heights of 14½ ft. It has a load capacity of 6,000 lbs. and has many applications in industrial plants and yards.

Four accessory tools add to the value of the machine, according to the company. These include a coal and snow bucket, a loose material bucket, a material bucket and a crane hook tool for general materials handling work.

The Shoveloader is mounted on four national makes of industrial wheel-type tractors—Case, Minneapolis-Moline, Sheppard and Oliver. The company says use of industrial tractors makes possible

Baker-Lull Shoveloader

operation of the Shoveloader under extreme conditions of mud, water, snow and uneven ground, because of high-flotation tires and high underclearance. For further information fill out a **Reader Service** card, using **Code Number 6-1.**

Business Bureau Reports on Liquid Fertilizer Advertising

"Liquid fertilizers have their advantages which can be properly advertised, but they will not displace dry fertilizers, which have other advantages, especially in providing nitrogen over a period of time."

That is one of the concluding statements in a special bulletin prepared by the National Better Business Bureau to assist advertisers, advertising agencies and media in preparation and review of advertising claims for liquid fertilizers.

Called "Liquid Fertilizer Advertising," the new bulletin is the result of several months' study of the nature and reported performance of liquid fertilizers, according to the Bureau.

Kenneth B. Willson, NBBB president, said the Bureau received invaluable assistance from many of the country's leading soil scientists who contributed factual information on the subject and reviewed the bulletin before publication.

The bulletin concludes:

"Where fertilizer elements can be used by above-ground parts of plants, the water soluble fertilizer is an economical, conveniently handled form but must be applied with great caution. When properly applied, it has advantages for the small gardener.

"Benefit will be achieved even if it does no more than increase the home gardener's watering of his growing things in order to apply the fertilizer.

"However, advertising should exercise care to avoid exaggeration of benefits to be received from factors of minor importance to the home gardener."

John R. Taylor Jr., agronomist for the American Plant Food Council was one of several experts who contributed information.

The bulletin discusses such phases of the field as trace elements, sequestering and chelating agents, foliar application, use of radioactive isotopes to test speed of absorption, hydroponics and vitamins and root hormones.

Industrial News

Summers Building Tenth Fertilizer Mixing Plant

A tenth fertilizer manufacturing plant will be constructed by Summers Fertilizer Co., Inc., of Baltimore, Md., in Sioux Falls, S. D.

Plans for the plant, which will have a seasonal capacity of 25,000 tons of mixed fertilizer, have been completed by Summers.

Site for the plant is a 10-acre tract on the C&NW railroad. The plant will be the first in the state to produce modern high test fertilizer mixtures, according to the company.

It is expected to be in operation by October. It will be of laminated arch type construction, 300 feet long with 100 foot span and piling height of 30 feet.

Contract for equipment has been awarded to Stedman Foundry & Machine Co. Summers' engineers designed the plant. It is one of a series of four which the company plans to erect in the Midwest. Others are planned for Taylorville, Ill., Portland, Ind. and Sarnia, Ont.

W. A. Stolt, now in charge of Summers' Grand Forks, N. D. plant, will be general manager of the new plant.

In a personnel change announced by the company, K. D. Morrison, vice president and sales manager, resigned June 1.

Atlas Holds Symposium

Atlas Powder Co. sponsored its second management symposium May 20 at the Blackstone Hotel in Chicago.

Nitrogen Unit Head

R. W. Briedenbach

A big step toward meeting worldwide nitrogen needs will be made shortly by Commercial Solvents Corp.

The company is readying new facilities for making nitrogen at its Sterlington, La., plant. The company says the nitrogen unit is the first post-war plant built to help meet the shortage of nitrogen. The facilities will double the company's present output of the fertilizer material for farm and industrial use.

Directing development of distribution for the increased production volume of nitrogen from the new facilities will be R. W. Breidenbach, manager of Commercial's San Francisco district office.

Breidenbach has been named assistant to Clyde Marshall, general manager of the agricultural chemicals division.

Before joining the company in 1948 Breidenbach served as director of research for the Standard Vanilla Corp. and a chemical research engineer for the Lockheed Aircraft Corp. He was an officer in the Navy during World War II.

Costing $20,000,000, the new Commercial facilities will increase production of anhydrous ammonia and will add two important basic sources of nitrogen to the company's line for agriculture.

These are Dixsol nitrogen solutions for mixed fertilizers and crystalline ammonium nitrate fertilizer for direct application to the soil.

The new facilities are the first of the chemical industry's privately financed nitrogen expansion programs aimed at a 70 per cent increase in production by 1956.

Lovejoy Retires After 33 Years with Fulton

After serving 33 years with the company, William C. Lovejoy, credit manager for Fulton Bag & Cotton Mills, retired last month.

He was succeeded by Wylie K. White, formerly assistant credit manager at Fulton.

He joined Fulton Bag in 1920 as credit manager.

In another personnel move, James A. Spaulding was appointed to the sales staff of the company in the central southern section of Texas with headquarters at Austin.

Industrial News

Joins Velsicol

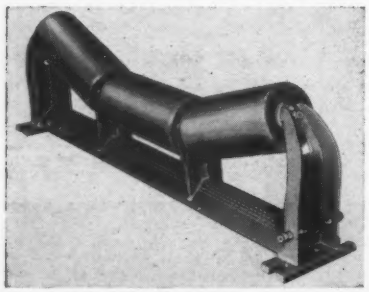
Dr. Roger W. Roth

New sales manager for the agricultural chemicals division of Velsicol Corp. is Dr. Roger W. Roth.

Dr. Roth will be in charge of domestic and export sales at the Chicago headquarters of the organization.

In another personnel move at the company George W. Suave and Howard S. Beaudoin were named to the sales staff, both assigned to the Western territory.

6-2 New S-A Belt Conveyor Carrier



New S-A Belt Conveyor

An innovation in belt conveyor carriers is described in recent literature from Stephens-Adamson Manufacturing Co.

The latest carrier developed by the company is designed with spun end rolls and welded steel frame.

For further information, fill out a **Reader Service** card, using **Code Number 6-2.**

Full Program Planned for Pacific Fertilizer Meeting

A WELL-ROUNDED program, including discussions on nearly every phase of fertilization, is planned for the fourth annual regional fertilizer conference sponsored by the Pacific Northwest Plant Food Association June 30, July 1 and 2.

It will be held at Washington State College, Pullman, Wash., with side trips to visit fertility experiments in the area.

Several leaders in the fertilizer industry are scheduled to address delegates to the conference. Included are W. R. Allstetter, vice president of the National Fertilizer Association and John R. Taylor, agronomist for the American Plant Food Council.

Discussions on soil testing, foliar analysis, economic aspects of fertilizer recommendations, fertility problems, movement of nitrogen in the soil, soil conditioners, liquid fertilizers and many other subjects are listed on the very full program, according to B. R. Bertramson, chairman of the program committee.

E. B. Shipley, of Swift & Co., president of the sponsoring association, will welcome delegates to start the conference, which will be held in the new Wilson Compton Union Building at the College.

More than 300 persons are expected to attend the meetings.

During the first day and a half of talks on soil fertility subjects and economics, the following speeches will be given by industry members:

"Economic Aspects of Fertilizer Recommendations," Alstetter; "We Still Have Frontiers," Taylor and "Liquid Fertilizers," Robert Luckhardt, Agriform Co., Costa Mesa, Cal.

The second afternoon's program will acquaint the audience with the geology, soils, engineering aspects and the soil research of the newly developed Columbia Basin Project which will bring nearly one million acres under irrigation during the decade 1950–60. Beside a tour of the project, arrangements have been made to stop at the development farms.

Dr. Vincent Sauchelli, director of agricultural research for Davison Chemical Corp., will address the conference with a talk entitled "Industry and Agriculture Team on Phosphorus Research."

6-3 Emulgate Groups By H. L. Woudhuysen

Improved penetration, spreading, adherence and film-forming are claimed for a unique new group of fungicides, called "emulgates."

The products have been developed by H. L. Woudhuysen & Associates, of New York City, after several years of investigation aimed at formulating oil-soluble organo-metallics as emulsifiable concentrates.

The emulsifiable concentrates, or emulgates, are applied as oil-in-water emulsions after dilution with water. The resultant chemical can be used in dipping, sprinkling or spraying operations.

Stable emulsions form easily, the company states, with no mechanical stirring or detergents required.

The emulgates carry in solution either singly or combined the aromatic or aliphatic compounds of cadmium, cobalt, copper, manganese, mercury, silver and zinc, etc. Structure of the metals inside the emulgates, the company explained, results in big savings of actual metal.

Now available from Woudhuysen, after successful testing, is the following material:

Mercusol—a solution of copper resinate and phenyl mercury salicylate, a grain seed disinfecting emulsion concentrate, adaptable to slurry treatments.

For further information on the emulgates fill out a **Reader Service card,** using **Code Number 6-3.**

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

ALDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Julius Hyman & Co. Div., Shell Chemical Corp., Denver, Colo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

AMMONIA—Anhydrous and Liquor
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Lion Oil Co., El Dorado, Ark.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM NITRATE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Lion Oil Co., El Dorado, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

AMMONIUM PHOSPHATE
Monsanto Chem. Co., St. Louis, Mo.

AMMONIUM SULFATE
See Sulfate of Ammonia

AMMONIUM SULFATE NITRATE
Baker & Bro., H. J., New York City

BAGS—Burlap
Bemis Bros. Bag Co., St. Louis, Mo.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Cotton
Bemis Bro. Bag Co., St. Louis, Mo.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Multiwall-Paper
Bemis Bro. Bag Co., St. Louis, Mo.
International Paper Co., Bagpak Div., N. Y. C.
Hammond Bag & Paper Co., Wellsburg, W. Va.
Hudson Pulp & Paper Corp., N. Y. C.
Jaite Company, The, Jaite, Ohio
Kraft Bag Corporation, New York City
McIver & Son, Alex. M., Charleston, S. C.
Raymond Bag Co., Middletown, Ohio
Union Bag & Paper Corp., New York City
Virginia-Carolina Chemical Corp., Richmond, Va.

BAGS—Dealers and Brokers
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.

BAG CLOSING MACHINES
Fischbein Co., Dave, Minneapolis, Minn.
International Paper Co., Bagpak Div., N. Y. C.

BAG CLOSING—THREAD & TWINE
Bemis Bros. Bag Co., St. Louis, Mo.

BAG PRINTING MACHINES
Schmutz Mfg., Louisville, Ky.

BAG FILLING MACHINES
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

BHC AND LINDANE
Ashcraft-Wilkinson Co., Atlanta, Ga..
Diamond Alkali Co., Newark, N. J.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Wyandotte Chemicals Corp., Wyandotte, Mich.

BONE PRODUCTS
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
McIver & Son, Alex M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BORAX AND BORIC ACID
American Potash and Chem. Corp., N. Y. C.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BROKERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

BUCKETS—Hoist, Crane, etc.
Hayward Company, The, New York City

CALCIUM ARSENATE
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.

CARS AND CART
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

CASTOR POMACE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
McIver & Son, Alex. M., Charleston, S. C.

CHEMISTS AND ASSAYERS
Gascoyne & Co., Baltimore, Md.
Shuey & Company, Inc., Savannah, Ga.
Wiley & Company, Baltimore, Md.

CHLORDANE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C
Pittsburgh Agricultural Chemical Co., N. Y. C.

CLAY
Ashcraft-Wilkinson Co., Atlanta, Ga.

CONDITIONERS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
Keim, Samuel D., Philadelphia, Pa.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio

CONTROL SYSTEMS
Sackett & Sons Co., The A. J., Baltimore, Md.

CONVEYORS—Belt
Sackett & Sons Co., The A. J., Baltimore, Md.

COPPER SULFATE
Phelps Dodge Refining Corp., New York City
Tennessee Corp., Atlanta, Ga.

COTTONSEED PRODUCTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa

DDT
Ashcraft-Wilkinson Co., Atlanta, Ga.
Diamond Alkali Co., Newark, N. J.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Wyandotte Chemicals Corp., Wyandotte, Mich.

DIELDRIN
Ashcraft-Wilkinson Co., Atlanta, Ga.
Julius Hyman & Co. Div., Shell Chemical Corp., Denver, Colo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

DILUENTS
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Wyandotte Chemicals Corp., Wyandotte, Mich.

DITHIOCARBAMATES
Berkshire Chemicals, New York City

DRYERS
Sackett & Sons Co., The A. J., Baltimore, Md.

ELEVATORS—Bucket
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

EMULSIFIERS
Atlas Powder Co., Wilmington, Del.
Wyandotte Chemicals Corp., Wyandotte, Mich.

ENGINEERS—Chemical and Industrial
Chemical Construction Corp., New York City
Fairlie, Inc., Andrew M., New York City
General Industrial Development Corp., N. Y. C.
Marietta Concrete Corporation, Marietta, Ohio
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.
Titlestad Corporation, Nicolay, New York City

FERTILIZER—Mixed
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Davison Chemical Corporation, Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Virginia-Carolina Chemical Corp., Richmond, Va.

FILLERS
McIver & Son, Alex. M., Charleston, S. C.
Universal Detergents Inc., Long Beach, Cal.

FISH SCRAP AND OIL
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

FULLER'S EARTH
Ashcraft-Wilkinson Co., Atlanta, Ga.

FUNGICIDES
American Agricultural Chemical Co., N. Y. C.
Berkshire Chemicals, New York City
Gen. Chem. Div., Allied Chem. & Dye, N. Y. C.
Tennessee Corp., Atlanta, Ga.

GAS MASKS
Willson Products, Inc., Reading, Pa.

GOGGLES
Willson Products, Inc., Reading, Pa.

HERBICIDES
Diamond Alkali Co., Newark, N. J.
Lion Oil Company, El Dorado, Ark.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Wyandotte Chemicals Corp., Wyandotte, Mich.

HERBICIDES—Oils
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Lion Oil Company, El Dorado, Ark.

HOPPERS & SPOUTS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind..

IMPORTERS, EXPORTERS
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Berkshire Chemicals, New York City
Southern States Phosphate & Fertilizer Co., Savannah, Ga.
Woodward & Dickerson, Inc., Philadelphia, Pa.

INSECTICIDES
American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Berkshire Chemicals, New York City
Diamond Alkali Co., Newark, N. J.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Julius Hyman & Co. Div., Shell Chemical Corp., Denver, Colo.
Pittsburgh Agricultural Chemical Co., N. Y. C.
Virginia-Carolina Chemical Corp., Richmond, Va.
Wyandotte Chemicals Corp., Wyandotte, Mich.

IRON SULFATE
Tennessee Corp., Atlanta, Ga.

LEAD ARSENATE
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.

LIMESTONE
American Agricultural Chemical Co., N. Y. C.
Ashcraft-Wilkinson Co., Atlanta, Ga.
McIver & Son, Alex. M., Charleston, S. C.
National Lime & Stone Co., Findlay, Ohio
Pittsburgh Agricultural Chemical Co., N. Y. C.

Buyers' Guide

Classified Index to Advertisers in 'Farm Chemicals'

LOADERS—Car and Wagon
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Acid Making and Handling
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Acidulating
Chemical Construction Corp., New York City
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Ammoniating
Sackett & Sons Co., The A. J., Baltimore, Md.

MACHINERY—Granulating, Fertilizer
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Grinding and Pulverizing
Atlanta Utility Works, The, East Point, Ga.
Bradley Pulverizer Co., Allentown, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Material Handling
Atlanta Utility Works, The, East Point, Ga.
Hayward Company, The, New York City
Hough, The Frank G. Co., Libertyville, Ill.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY—Mixing, Screening and Bagging
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Sturtevant Mill Co., Boston, Mass.

MACHINERY—Power Transmission
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MACHINERY
Superphosphate Manufacturing
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

MAGNESIUM SULFATE
Berkshire Chemicals, New York City

MANGANESE SULFATE
McIver & Son, Alex. M., Charleston, S. C.
Tennessee Corp., Atlanta, Ga.

MANURE SALTS
Potash Co. of America, Washington, D. C.

MINOR ELEMENTS
Tennessee Corporation, Atlanta, Ga.

MIXERS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

NITRATE OF POTASH
Berkshire Chemicals, New York City

NITRATE OF SODA
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NITROGEN SOLUTIONS
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Lion Oil Company, El Dorado, Ark.
Phillips Chemical Co., Bartlesville, Okla.
Spencer Chemical Co., Kansas City, Mo.

NITROGEN MATERIALS—Organic
American Agriculture Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

NOZZLES—Spray
Monarch Mfg. Works, Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

PARATHION
Ashcraft-Wilkinson Co., Atlanta, Ga.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

PENTACHLOROPHENOL
Monsanto Chemical Co., St. Louis, Mo.

PHOSPHATE ROCK
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

PHOSPHORIC ACID
American Agricultural Chemical Co., N. Y. C.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Monsanto Chemical Co., St. Louis, Mo.
Virginia-Carolina Chemical Corp., Richmond, Va.

PLANT CONSTRUCTION—Fertilizer and Acid
Atlanta Utility Works, The, East Point, Ga.
Chemical Construction Corp., New York City
General Industrial Development Corp., N. Y. C.
Monsanto Chemical Co., St. Louis, Mo.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.
Titlestad Corporation Nicolay, New York City

POTASH—Muriate
American Potash & Chemical Corp., N. Y. C.
Ashcraft-Wilkinson Co., (Duval Potash) Atlanta, Ga.
Baker & Bro., H. J., New York City
Duval Sulphur & Potash Co., Houston, Tex.
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Potash Co. of America, Washington, D. C.
United States Potash Co., N. Y. C.

POTASH—Sulfate
American Potash & Chemical Corp., N. Y. C.
Baker & Bro., H. J., New York City
International Min. & Chem. Corp., Chicago, Ill.
McIver & Son, Alex. M., Charleston, S. C.
Potash Co. of America, Washington, D. C.

POTASSIUM PHOSPHATE
Monsanto Chemical Co., St. Louis, Mo.

PRINTING PRESSES—Bag
Schmutz Mfg. Co., Louisville, Ky.

PYROPHYLLITE
Ashcraft-Wilkinson Co., Atlanta, Ga.

REPAIR PARTS AND CASTINGS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

RESPIRATORS
Willson Products, Inc., Reading, Pa.

SACKING UNITS
Sackett & Sons Co., The A. J., Baltimore, Md.

SCALES—Including Automatic Baggers
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

SCREENS
Atlanta Utility Works, The, East Point, Ga.
Sackett & Sons Co., The A. J., Baltimore, Md.
Stedman Foundry and Machine Co., Aurora, Ind.

SEPARATORS—Air
Sackett & Sons Co., The A. J., Baltimore, Md.

SOIL CONDITIONERS
Wyandotte Chemicals Corp., Wyandotte, Mich.

SPRAYS
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Spraying Systems Co., Bellwood, Ill.

STORAGE BUILDINGS
Marietta Concrete Corporation, Marietta, Ohio

SULFATE OF AMMONIA
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C.
Jackle, Frank R., New York City
Lion Oil Co., El Dorado, Ark.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Phillips Chemical Co., Bartlesville, Okla.
United States Steel Corp., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFATE OF POTASH—MAGNESIA
International Min. & Chem. Corp., Chicago, Ill.

SULFUR
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
Texas Gulf Sulphur Co., New York City
Woodward & Dickerson, Inc., Philadelphia, Pa.

SULFUR—Dusting & Spraying
Ashcraft-Wilkinson Co., Atlanta, Ga.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
U. S. Phosphoric Products Div., Tennessee Corp., Tampa, Fla.

SULFURIC ACID
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
Lion Oil Company, El Dorado, Ark.
Monsanto Chemical Co., St. Louis, Mo.
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.

SURFACE ACTIVE AGENTS
Universal Detergents Inc., Long Beach, Cal.

SUPERPHOSPHATE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
Baker & Bro., H. J., New York City
Davison Chemical Corporation, Baltimore, Md.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
Mathieson Agricultural Chemicals Co., Little Rock, Ark.
McIver & Son, Alex. M., Charleston, S. C.
Southern States Phosphate Fertilizer Co., Savannah, Ga.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

SUPERPHOSPHATE—Concentrated
Armour Fertilizer Works, Atlanta, Ga.
Baker & Bro., H. J., New York City
International Min. & Chem. Corp., Chicago, Ill.
U. S. Phosphoric Products Division, Tennessee Corp., Tampa, Fla.
Virginia-Carolina Chemical Corp., Richmond, Va.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TALC
Ashcraft-Wilkinson Co., Atlanta, Ga.

TANKAGE
American Agricultural Chemical Co., N. Y. C.
Armour Fertilizer Works, Atlanta, Ga.
Ashcraft-Wilkinson Co., Atlanta, Ga.
International Min. & Chem. Corp., Chicago, Ill.
Jackle, Frank R., New York City
McIver & Son, Alex. M., Charleston, S. C.
Woodward & Dickerson, Inc., Philadelphia, Pa.

TEPP
Monsanto Chemical Co., St. Louis, Mo.
Virginia-Carolina Chemical Corp., Richmond, Va.

TOXAPHENE
Ashcraft-Wilkinson Co., Atlanta, Ga.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Pittsburgh Agricultural Chemical Co., N. Y. C.

2, 4-D
Diamond Alkali Co., Newark, N. J.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

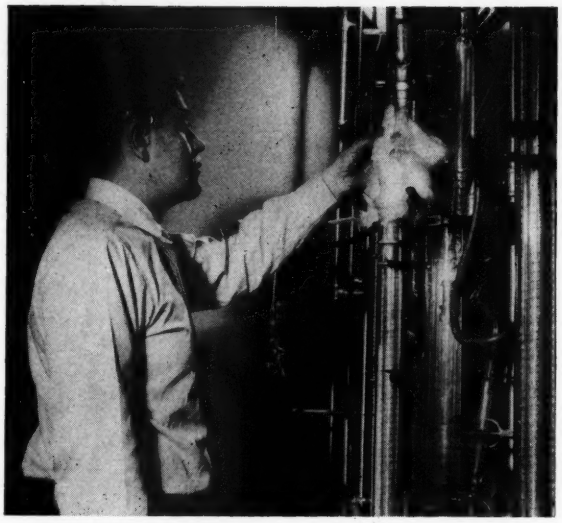
2, 4, 5-T
Diamond Alkali Co., Newark, N. J.
Gen. Chem. Div., Allied Chem. & Dye, N.Y.C.
Monsanto Chemical Co., St. Louis, Mo.
Pittsburgh Agricultural Chemical Co., N. Y. C.

UREA & UREA PRODUCTS
Baker & Bro., H. J., New York City
Nitrogen Div., Allied Chemical & Dye Corp., N.Y.C

VALVES
Atlanta Utility Works, The, East Point, Ga.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Sackett & Sons Co., The A. J., Baltimore, Md.

WETTING AGENTS
Universal Detergents Inc., Long Beach, Cal.
Wyandotte Chemical Corp., Wyandotte, Mich.

ZINC SULFATE
Tennessee Corp., Atlanta, Ga.



Wyandotte research worker uses one of many types of distillation columns available in new center.

For better pesticides . . .

New Research Center

IT'S TRUE that new farm chemicals seem to spring like magic from industry plants throughout the country. But it isn't true, of course, that there is any sleight of hand involved in putting them on the market.

Instead, as any member of the industry knows only too well, months—sometimes years—of research are necessary before a product can be declared ready for commercial sale.

Millions of dollars are spent every year for research, thousands of men are employed full time in it and countless experiments are run to develop new pesticide and fertilizer products.

Improved Research Facilities

A leading member of the farm chemicals industry took steps this month to improve its research setup "to provide more and better chemical products for industry and the public."

The company, Wyandotte Chemicals Corp., opened a new research center at Wyandotte, Mich., June 7.

Wyandotte now makes lindane, DDT, BHC, Kreelon, wetting agents, weed killers and soil conditioners.

The new center, according to President Robert B. Semple, will contribute further to Wyandotte's rising importance in research and development activities.

As Flexible as Movie Sets

The center includes laboratories with movable walls and built-in services that make them as flexible as movie sets.

The labs, covering a city block, are of two-story brick construction. The center was started in 1951 as one of the projects in a company-wide expansion program. It is 172 feet long and 322 feet wide.

The center permits a consolidation of the company's many research and development activities. ◆

Alphabetical List of Advertisers

No Time for Laws?

THE questionnaire FARM CHEMICALS sent out to leaders in the pesticide industry on the Miller and Delaney bills last month showed three interesting things (aside from the very important point that all who answered favored the Miller legislation):

1. Many members of the pesticide industry, in top management positions, are in the dark about pending federal legislation of direct concern to the industry.

2. Most of these men are content to let some trade organization (the National Agricultural Chemicals Association in most cases) analyze the legislation and advise its members accordingly.

3. The NAC is doing an excellent job in its role as watchdog of federal and state legislation affecting the industry.

What with the pesticide business being the rat race it is (rodenticidal pun unintended) it's not surprising that we got such answers as these to our request for comments on the pesticide bills now being aired in Congressional committees:

"*. . . I have been so busy dealing with a highly competitive pesticide market that I have had little opportunity either to care about or worry about legislation and have left it in the good hands of Lea Hitchner of the NAC and his legislative committee. . . .*"

"*. . . Very frankly we are not sufficiently conversant with the details of the various bills to comment on them. . . .*"

With this time factor, coupled with the fact that one virtually has to be a lawyer to untangle all the details of any Congressional legislation, it isn't surprising that many companies in the industry fall back on the facilities of the NAC to do their thinking for them.

Such a move is by no means a reluctant one on the part of the industry, according to the letters received in our office. On the contrary, industry leaders are confident that the association, with its legal staff and its close vantage point of the Washington scene is a logical recourse.

It was this expression of confidence in NAC that leads naturally to our third point—that the association is doing an excellent job of examining legislation, summarizing and evaluating it and relaying the information to its members.

The situation shows a healthy working relationship of the Washington office with members throughout the country.

Still, actions of the industry in assuring that legislation regulating it is fair and workable would be greatly strengthened if its members had at least a general knowledge of the pending laws.

Many, of course, do (as the cogent comments in last month's issue demonstrate) but too many others are in the dark.

Familiarizing yourself with the many important points involved in the current federal legislation can go a long way toward complementing the able job being done by the NAC.

A good place to start is with a reading of the complete text of the Miller and Delaney bills, printed in the May FARM CHEMICALS.

* * *

ANOTHER fertilizer record. That's the story told in considerable detail in the USDA report appearing on page 45 in this issue.

The upward trend has been in effect for the past 14 years. Industry and government officials have become so blasé toward the rising figures year after year that the official report from the USDA didn't even note the fact that the 1951-52 totals were the highest on record.

Neither industry nor government, to be sure, feels complacent about the tremendous production of plant foods.

The industry realizes that if we are ever going to fill that not-so-mythical fifth plate it must continue to do more than just produce fertilizers.

It must sell them all to farmers in all parts of the country.

More than that the industry must help the department of agriculture in assuring that none of the plant food materials goes to waste—that the nutrients are utilized efficiently and intelligently to produce highest possible yields—a job that will be discussed in further detail at the NFA and APFC conventions this month.

—HAMILTON C. CARSON

Farm Magic

Magic of man-made variety, used in the attainment of recent high crop goals, has wrought truly amazing results.

In the production of high grade red muriate of potash, one of the commodities most vitally needed by American farmers, Potash Company of America is helping the fertilizer industry bring about some of this farm magic.

POTASH COMPANY of AMERICA
Carlsbad, New Mexico

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Southern Sales Office . . . Candler Building, Atlanta, Ga.

International MINERALS & CHEMICALS

phosphate division

INTERNATIONAL MINERALS & CHEMICAL CORPORATION, *General Offices: 20 N. Wacker Dr., Chicago 6*

Phosphate mines and plants in Florida at Noralyn, Peace Valley, Achan, Mulberry; in Tennessee at Mt. Pleasant and Wales

End